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THE SIXTY-NINTH ANNUAL CONVENTION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION WILL BE HELD IN NEW ORLEANS, LA., DURING WEEK OF SEPTEMBER 5, 1921

The 1921 meetings of the American Conference of Pharmaceutical Faculties and the National Association of Boards of Pharmacy will also be held in New Orleans during Convention Week

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PROF. DR. HEINRICH ZÖRNIG,

BASEL, SWITZERLAND

Honorary Member of American Pharmaceutical Association, 1916

HEINRICH ZÖRNIG

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. X FEBRUARY 1921 NO. 2

DR. HEINRICH ZÖRNIG.

Professor Dr. Heinrich Zörnig was born in Barmen, Germany, December 27, 1866, where he attended the Realgymnasium. He took up pharmaceutical studies in 1884 in Erlangen and, as a clerk, was active for several years in Barmen, Elberfeld, Nohfelden, Zofingen and Basel. He studied at the universities of Basel and Giessen and was assistant at the Pharmacological Institute of the latter university for two semesters, 1892 3. In Barmen he was drug clerk from 1893 to 1895, and proprietor of a pharmacy in Goch from 1895 to 1901. After selling his pharmacy he returned to the university and from 1901 to 1903 pursued his studies at Heidelberg under Prof. v. Goebel; in 1905 he taught pharmacognosy there, and in 1907 was "kustos" at the same institution. In 1906 he became a member of the examining board for pharmaceutical State examination.

In 1916 he was called to the University of Basel as professor of pharmacy, where he founded the new pharmaceutical department and its collections. During his time at Munich, Professor Zörnig established the pharmacological collection there, now one of the largest and most complete in Germany; he also supervised the arrangement of the new public botanical museum.

During his scientific tours he visited in Austria, Hungary, Istria, Dalmatia, Montenegro, Italy, Sicily, Algiers, Morocco, Switzerland, France, England, Holland and at various German universities.

He has devoted much time to research in the study of the anatomy of medicinal plants, crude drugs and drug powders, drug plant culture, drug geography, etc. He has also contributed largely to the prerequisite question and the reform of studies for pharmacists. In pharmaceutical circles his best known work is "Arzneidrogen," 2 volumes, and "Tabellen zur Mikroskopischen Bestimmung der Drogenpulver." At the present time he is engaged with the revision of the pharmacognostical parts of "Hager's Handbuch."

Professor Zörnig was elected an honorary member of the American Pharmaceutical Association in 1916.

HUGO KANTROWITZ.

EDITORIAL

E. G. EBERLE, Editor 253 Bourse Bldg., PHILADELPHIA

NO LAW IS STRONGER THAN THE PUBLIC OPINION BEHIND THE LAW.

OF the making of laws there is no end, particularly those for the control and sale of narcotics. But, it is becoming more and more evident that these laws are not yielding wholly satisfactory results; and, as the New York *Commercial* of recent date (January 25, 1921) editorially states, under the subject of "Laws for the Control of Narcotics:"

"The tendency is, when a situation involving enforcement of the laws gets out of hand, to seek new laws still more drastic in the hope of correcting the situation. Present laws for the control and sale of narcotic drugs were regarded as drastic enough at the time of their passage, and yet seem to have failed of their purpose for one reason or another. The real reason, so far as the drug trade seems to be able to determine, is the lax enforcement of the present law, and there is no assurance that anything of a more drastic nature would correct the evil if there were the same lax enforcement.

"Law-abiding citizens obey the law of their own accord. Those of evil tendencies disobey the laws and are the ones to be watched. A more drastic law will have the effect of dealing more harshly with those at whom it is not especially aimed, while those who have no compunction about breaking laws will break a severe one with as little hesitation as a mild one. The main thing is to secure an impartial enforcement of existing laws, which is not being done now.

"The abuses at which the new legislation is aimed in the bill introduced by Senator Jones and Representative Miller have grown up, not because of any defect in the law, but because of the defects in its enforcement. The danger is, as the New York Board of Trade and Transportation points out, that the effect of this new legislation would so seriously interfere with the legitimate trade in narcotics that it would also have a serious effect upon trade in other drugs. It is not new legislation that is wanted so much as better administration."

The fact cannot be too strongly emphasized that no law, alone, however drastic, is a specific for abnormal conditions of the city, state or national body, any more than a drug can be a specific for an ill of the human body irrespective of its indication or manner of application. In both cases, *i. e.*, the law and the drug, the use of each must be clearly indicated, and fearlessly and intelligently applied, and in the former case applied, also, irrespective of political influence and opportunity.

How can the narcotic laws be better administered? There is only one answer. By public opinion expressing its approval of them and demanding their strict enforcement. No stream can rise higher than its source, and the strength of all

law, in its administration, is in the public opinion behind it. With strong public opinion behind a law, the weakest law will be administered efficiently by public officials, as a rule; with weak public opinion behind the strongest law, its administration will be weak and inefficient or sometimes worse—a law for revenue only by grafting officials.

What this country needs to-day is not more law, but the better administration of law; not more drastic control of individual liberty, but more civic righteousness; not license, but stronger moral sense in the individual and greater respect for constituted law and order, and the only way to secure these things is through the education of the individual—for public opinion is simply collective individual opinion—to the end that there may be bred higher ideals of individual thought and conduct, especially with reference to the rights of others. Law is simply a rule of action established by authority, and in this country, thank God, authority established by the consent of the governed—by the majority and not by the minority.

General Grant was right when he said that the quickest way to secure the repeal of a bad law was to rigorously enforce it, and public opinion would then compel its repeal; for no law is stronger than the public opinion behind the law.

J. W. ENGLAND.

DEDUCTIONS FROM A PASTEUR LECTURE.

THE Pasteur Lecture by Graham Lusk on "Some Influences of French Science on Medicines" is printed in the *Journal of the American Medical Association*, January 1, 1921. The development of the sciences is traced, and the influence of the work of pharmacists plays no unimportant part, notably that of Scheele. The author makes the following statements:

"It is interesting to consider the differences in the lives of the men concerned in the great discoveries of the last quarter of the eighteenth century. Priestley, an indigent clergyman; Cavendish, of whom it was said that he was the most wealthy of learned men and the most learned of the wealthy; Scheele, a poor Swedish apothecary; and Lavoisier, a man of affairs, a noble of high social position in receipt of huge personal revenues. What is it, then, that makes for greatness in science? Would Lavoisier have accomplished more had he been on a 'full-time' basis with a restricted income? It is a question of individual opinion, but to most people it would appear that scientific greatness depends primarily on the quality of the intellectual protoplasm of the brain, on the advantages offered to the functioning of that brain, and on the possession of a good conscience. These factors and not a coerced limitation of income are the driving forces toward the revelation of scientific truth."

"If we can only learn what the conditions are for the production of scientific men, and provide such conditions, the world will gain hugely."

The author quotes a British scientist in saying that "The Greeks had no classical education, but they had the two essentials of true education: first, the ability to express themselves correctly in words, and, second, to appreciate their own relation to their surroundings, which latter is science." He concludes, "It is in this sense that Lavoisier and Pasteur brought understanding into the minds of men."

In contemplating his results in the first respiration experiments on man, Lavoisier said:

"This kind of observation suggests a comparison of forces concerning which no other report exists. One can learn, for example, how many pounds of weight-lifting correspond to the effort of one who reads aloud or of a musician who plays a musical instrument. One might even value in mechanistic terms the work of a philosopher who thinks, the man of letters who writes, the musician who composes. These factors, which have been considered purely moral, have something of the physical and material which this report allows us to compare with the activities of a man who labors with his hands. It is not without justice that the French language has united under the common expression *work* the effort of the mind with that of the body, the work at the desk with the work at the shop. * * * "

Lavoisier's life outside of his laboratory was that of a public official, a tax gatherer, a manufacturer of gunpowder, the quality of which he greatly improved. He purchased a large landed estate and made experiments in scientific agriculture, doubling the wheat crop, quintupling the number of beasts on the land, and earned thereby the enduring gratitude of French peasants. He exemplified science and industry in coöperation.

Such coöperation is needed to-day to open the marts of the world; selfish motives of nations, corporations and individuals should be displaced by the spirit which actuates scientists. Truth is essential in science, and equally important in business; it is the basis for the restoration of confidence and that seems to have been somewhat lacking in commerce and among governments; the activity of interrelation and rational, reasonable coöperation is necessary for healthy conditions.

There is also needed a closer relation of universities and schools with the people; there is to some extent a lacking in understanding, wherein both are at fault, and the only way to bring about the right relation is for the universities to study the life of the trades and industries, and extend the field of their usefulness. Great work along these lines has been done; there are opportunities for largely extending it; essential thereto is a livelier appreciation of coöperation by universities and schools and a growing realization by the people that "the cultivation of science in its highest expression is perhaps even more necessary to the moral condition of a nation than to its material prosperity." E. G. E.

THE RELATION BETWEEN STRUCTURE AND PHYSIOLOGICAL ACTION OF THE ALCOHOLS.*

BY OLIVER KAMM.

The reaction of the living organism towards chemical reagents is usually of a character sufficiently complex to discourage attempts at generalization. It was because of this reason that the present inquiry into the relationship between physiological action and chemical constitution was limited to an extremely simple class of organic compounds, the mono-hydroxy primary aliphatic alcohols, it being the intention to carry the study progressively to the less common members as well as to aromatic derivatives of the benzyl type.

Although this initial study was considerably and intentionally restricted from the chemical side, the physiological effect studied (toxicity) was directed toward various types of organisms. An attempt has been made also to seek the relation between certain physical and chemical properties of these alcohols and their relative toxic action. The data utilized in the subsequent discussion has been drawn not only from the writer's own observations but also from data previously published.

Morgan and Cooper[1] have studied the effect of chemical constitution upon the germicidal power of the mono-hydroxy aliphatic alcohols and have presented data to show that the toxicity in a given homologous series increases in the order of the molecular weights. The same generalization has been completely verified by Macht[2] in a study of the acute toxicity of these alcohols when injected into the blood stream of the cat. This generalization, known as Richardson's Rule, has been the subject of numerous investigations, references to which may be found in Macht's recent contribution to the subject.

It is the purpose of this report to connect Macht's toxicological data and that already available from the bacteriological standpoint, with additional observations made by the writer, in two directions, *viz.*: (*a*) the effect of alcohols on the coagulation of proteins, and (*b*) the toxicity of alcohols to paramecia.

A comparison between these values, obtained from such varied sources, is well illustrated in the following table in which the effect of ethyl alcohol is expressed as unity:

Alcohol used.	Acute toxicity to cats (Macht).	Germicidal powers (Morgan & Cooper).	Toxicity to paramecia (Kamm).	Albumen coagulating power (Kamm).
Methyl	0.8	0.95	0.8	0.9
Ethyl	1.0	1.0	1.0	1.0
n-Propyl	2.5	2.5	1.9	2.0
n-Butyl	16.6	8.0	4.5	5.0

In testing the albumen coagulating powers of the alcohols a 5 percent solution of egg albumen was used and comparative observations made at a temperature of 50° C. The concentration of alcohol necessary to produce practically complete coagulation during 10–15 minutes was then determined. The results

* Read before the Detroit Branch of the American Pharmaceutical Association, December 1920.

[1] Eighth Int. Cong. Appl. Chem., VIII, d, p. 245 (1912).

[2] *J. Pharmacol.*, 16, 1 (1920).

are expressed in terms of ethyl alcohol as unity, methyl alcohol being found slightly less efficient than ethyl alcohol, whereas 2 percent *n*-butyl alcohol produced an effect equal to a 10 percent concentration of ethyl alcohol. These results are of only a preliminary character.

The data for toxicity to paramecia presented above are found to obey the rule that in this series of alcohols the physiological action increases with increasing molecular weight and this generalization holds also for the protein-coagulating powers of these alcohols.

Since the physical properties of these alcohols also vary progressively with the molecular weights we must conclude that the effects upon the living organism present no special abnormality and it would appear that one may now predict the toxicity of compounds in this series with approximately the facility with which the chemist has been accustomed to predict their physical properties. Where abnormal physical and chemical properties occur one meets corresponding abnormal physiological effects.

The values for methyl alcohol as given in the above table possess little relation to the deleterious action of methyl alcohol when taken into the digestive tract. It has been repeatedly pointed out by many writers that the latter action is due to secondary effects called forth possibly by the intermediate oxidation products of methyl alcohol, and these secondary effects are not directly connected with the above measurements of acute toxicity.

The high antiseptic power of normal butyl alcohol, which possesses a phenol coefficient of 0.25, is of interest because of the availability of this compound. Before the war this material was classified as a rather rare chemical and many of its simple derivatives were unknown. During the war, however, this alcohol was obtained as a by-product in the production of acetone by fermentation of carbohydrate material, and it is now one of the cheapest of organic chemicals.

In seeking a numerical expression for the above results the writer was surprised to note the semi-quantitative agreement with the following geometrical progression:

$$1 : 3^1 : 3^2 : 3^3,$$

provided that the values for the alcohols be expressed as moles and not as grammes, ethyl alcohol being represented as the first member. Thus for protein coagulation the observed values are:

Ethyl	Propyl	Butyl
1.0	2.6	8.0

Reference to the first table shows that the toxicity values on paramecia (when reinterpreted in moles) are not far removed from this generalization. Normal propyl alcohol agrees well with this rule even in its toxicity towards cats, but abnormalities are met with in butyl alcohol which may possibly be ascribed to the fact that a too concentrated solution of this effective material was injected intravenously. The concentration used by Macht (5 percent) is extremely effective in coagulating protein and it would therefore be of interest to determine toxicity using a 1 percent solution.

Upon first consideration it might appear as if protein coagulation were the prime cause of toxicity in all of these tests. It is not intended, however, to convey

this impression. A second important factor to be considered is the increase of toxicity due to increase in lipoid solubility as one goes higher in this homologous series. Toxicity when the material is injected into the blood stream is no doubt greatly dependent upon the latter factor, which here may become more important than the protein coagulating factor. Macht has presented data for the iso-alcohols (isopropyl, isobutyl, and isoamyl) in respect to toxicity when injected into the blood stream, the relative toxicities observed being 1 : 2.75 : 9.6 which yield the ratios 1 : 3.4 : 14 when expressed as moles.

A natural question that now arises is this: To what extent will this semi-quantitative generalization hold among the higher homologues? This is to be answered experimentally, although one may predict that the higher homologues which approach closer and closer to the hydrocarbons in their physical properties, will be so slightly soluble in water that they may not admit of being subjected to a legitimate test. This limit will no doubt be found between the range C_6–C_{10}.

The above "rule of three" is of interest especially because Traube[1] has shown that such a relation exists between the relative surface tensions of aqueous solutions of these alcohols, and, what is still more important, he has also shown that hypnotic action of certain classes of compounds, particularly the urethanes, obeys this same numerical rule.

Although within a given homologous series of alcohols both toxicity and hypnotic action increase regularly with increasing molecular weight, the opposite may be found true in comparing alcohols falling in different homologous series. Thus the normal primary, secondary, iso, and tertiary alcohols, respectively, *decrease* in toxicity as we go from the straight chain to the branched molecule. On the other hand, hypnotic action fortunately *increases* in the same order.

The present treatment of the subject, directed toward the simplest class of alcohols, and only to the lower members in this class, is intended simply as an elementary basis for later work.

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PHARMACEUTICAL RESEARCH.*

BY GEORGE M. BERINGER.

The most ancient records available show that from time immemorial the progressive peoples of each period recognized that the preparation and dispensing of medicines was an important vocation to be entrusted only to those specially trained and educated to perform such duty to society. In ancient Egypt, the priests of Isis alone compounded and dispensed the prescriptions of the physician priests. The Israelites evidently held the apothecaries in high esteem as the Biblical records contain a number of references to them and their work. The holy anointing oil and the incense were both directed to be "compounded after the art of the apothecary." To Eleazar of the priesthood, the son of Aaron, were entrusted the services and duties at that time performed by the apothecary.

[1] Pflügers *Arch. Physiol.*, 105, 559.

* Address delivered before the New York Branch of the American Pharmaceutical Association, January 10, 1921.

So we as pharmacists can take just pride in that we are engaged in a most ancient and honored calling.

The student of the history of pharmacy is soon brought to realize that pharmacy has played no small part in the world's progress and that pharmacists have made many valuable contributions to the knowledge of materia medica, botany, chemistry and allied sciences and that some of these, of the greatest benefit to mankind, are constantly employed in the professions and industries. He likewise becomes painfully aware of the fact that ofttimes the credit is given to, or taken by, other branches of science. The writers of Encyclopoedia articles and similar works of reference are especially faulty in their failure to recognize the importance of the contributions of the unobtrusive workers in science despite the services of incalculable value that these have rendered to mankind. To most of these authors and compilers the activities of the warrior, the statesman, or politician, so often destructive of the world's progress, and even of the novelist, seem to be of paramount importance for perpetuation. Since the influence of pharmacy has been quite commonly overlooked by these general historians, it remains as one of the duties of pharmacists to see that the scattered data and facts concerning the lives and contributions of pharmacists are collected, preserved and published so that it shall be established beyond peradventure as to whom credit is justly due.

Throughout the medieval period, and especially that portion which is referred to as the age of the alchemist, the contributions to the sciences were largely made by the investigators in medicine and the apothecaries who were aiming to improve the methods of preparing their remedies and of discovering new substances of therapeutic value.

Among the English-speaking nations there has been unfortunately a too apparent disposition to disparage the work of the apothecaries, and during the fourteenth century they were commonly referred to as the "physician's cooks," and even in comparatively recent times, as the "physician's handmaids." It is evident to the student of history that a relatively small percentage of medical practitioners have been engaged in actual research work, and that a goodly number of pharmacists have carried on research in behalf of pharmacy that will compare favorably with any that has emanated from the medical branch.

I cannot at this time delve too deeply into the debt of the world to pharmacy, for I conceive that a discussion of that topic would occupy the entire evening and preclude the consideration of the subject that has been assigned for this time. Nevertheless, it has such a close association with the subject of research that I cannot refrain from giving a few illustrations that must serve the purpose of the present occasion.

The study of the sciences undertaken by Davy as an apprentice to a surgeon-apothecary no doubt gave him his first insight into chemistry and determined the bent of his mind toward chemical research. The results of these investigations won for him reward and undying fame as the discoverer of a number of the important chemical elements.

That peerless, indefatigable experimenter and ideal research worker, Karl Wilhelm Scheele, is constantly referred to as the "great Swedish chemist," and his name is scarcely ever associated with pharmacy. Yet he studied pharmacy, and for the major part of his comparatively short life depended upon this calling

for his livelihood. During the last eleven years of his life, he owned and managed a pharmacy, and was supported thereby while carrying on some of his most successful experiments. His activities and investigations cover a very wide range of topics of the utmost importance to mankind. The discoveries of chlorine; barium; manganese and the investigations of its applications to the glass industry, of tartaric acid; arseniureted hydrogen; his studies of the cyanides such as Prussian blue and hydrocyanic acid; and of the composition of the atmosphere, are but some of the contributions of this pharmacist to the world's progress. These can be traced largely to contact with the wares and the problems of his chosen vocation. Who is prepared to estimate the world's indebtedness to this studious, observing and painstaking worker, many of whose discoveries are still in daily application in our industries?

Klaproth is another apothecary whose early investigations of the composition of pitchblende led him to the discovery of uranium, and this was the initial step that has led up to the discovery of that remarkable group, the radio-active elements.

In the field of organic chemistry important contributions to our knowledge can be traced to pharmacists and numerous are the illustrations available. I must here content myself with only citing for your attention the fundamental work of Sertürner and of Pelletier and Caventou upon the alkaloids. The galaxy of brilliant investigations emanating from pharmacists who have engaged in research in this interesting domain covers nearly every civilized nation, and the results have been of inestimable value in the practice of medicine.

Research is best defined as a careful search for the truth, and so it can be safely asserted—that no authoritative work is accomplished, no scientific investigation or discovery is made, and no theory that is sound is propounded that is not based upon research.

Research is generally subdivided into that which is "pure" and that which is "applied." The distinction is made upon the basis of the latter being undertaken with a specific need in view and that the results will be applicable to the solving of some industrial and commercial problem, usually of monetary advantage. Practical application is commonly the reason that actuates the establishing of research departments in most of our large industries. No one can take exception to this as, eventually, the discoveries and inventions made are disseminated to the advantage of all. Yet there is a feeling held by the real scientists that personal interests should not blind one to the obligation of true citizenship, to contribute his full share toward public welfare and scientific progress.

While the truly scientific and enthusiastic research worker engages in "pure research," possibly with the thought of clearing up some abstruse question that, although advancing our sum of human knowledge, may at the time have no apparent practical application, it happens ofttimes that his work and discoveries become of exceedingly great value and unexpected important application. The discoverer of the Herzian waves had no thought of the utilitarian value of his discovery and the later application thereof to wireless telegraphy. The investigation of our own Prof. John Uri Lloyd on the subject of precipitates in fluidextracts was undertaken because the question was deemed a pharmaceutical problem of the time demanding attention, and his publications were then considered simply from a pharmaceutical view-point. We are now proud of the association and the

distinction awarded these by Dr. Wolfgang Ostwald as fundamental and important early studies in colloidal chemistry and claim the credit for priority of publication in the Proceedings of the American Pharmaceutical Association.

Recently we had the pleasure of listening to a lecture by Prof. Edward Kremers of the University of Wisconsin, in which he detailed the investigations carried on for upwards of twenty-five years on certain American species of Monarda. His studies of the aromatic principles and the other constituents of these plants constitute an elaborate piece of pharmaceutical research that is destined to become a classic contribution to phyto-chemistry. While this may be viewed as a pure scientific investigation, whose main value will be as a pioneer and in its suggestion for similar investigations directed to other groups of plants, it has cleared up a number of points relating to the source, composition and production of some of the important aromatic plant constituents, and I predict that it will prove of material assistance and pecuniary value to the industries engaged in preparing these on a commercial scale.

The history of Cinchona cultivation is an interesting narrative of scientific research applied to every phase of the subject. The selection of the species and varieties of Cinchona yielding alkaloids; the study of the alkaloidal content of the different barks; the problems of soil, climate, and altitude, and their influence upon the character and percentage of alkaloidal content of the bark; the production of varieties yielding the largest percentage of quinine; the study of the localization of the alkaloids in different parts of the plant, the effect of climate, season, etc., upon these, and their transformation from amorphous to the crystalline state during the development of their plant organs; the discovery of the value of partial stripping, the best time for this operation, and the renewal of the bark by mossing; the modern methods of marketing the bark and alkaloids; the improved process of manufacturing the alkaloids in a high degree of purity; these are some of the problems that had to be worked out scientifically and the value of the results from either a commercial or a humanitarian view-point is beyond calculation. It is a gigantic example of practical applied scientific research. Notwithstanding all that has been accomplished by the study and scientific investigation of the Cinchonas, the subject is not exhausted. The paper by Howard and Chick on "Some Recent Samples of Grey Cinchona Bark"[1] demonstrates the necessity for a thorough reinvestigation of the grey cinchonas of Peru to determine positively by newly collected authentic specimens the species yielding the bark containing the high percentage of cinchonine reported, and whether this was due to the altitude at which the trees grew. This paper presents the possibilities for duplicating the cultivation of the Ledgeriana variety of *Cinchona Calisaya* in which quinine almost alone is present to a high percentage by the cultivation of a selected Cinchona of the grey bark group for the production of cinchonine.

In addition to the classification of research as "pure" and "applied," I would advocate a further subdivision as especially applicable to pharmacy; namely, major and minor investigations in both pure and applied research. Every apothe-

[1] *The Pharmaceutical Journal and Pharmacist*, July 24, 1920. Reprinted in *The American Journal of Pharmacy*, October 1920.

cary has opportunities from time to time to note improvements in formulas, methods of manipulation and niceties in compounding, what our friend Thomas McElhenie calls "wrinkles." These observations, although they may appear individually as comparatively insignificant, yet, if they be but suggestions for improvement, in the aggregate they will make toward a substantial advancement in the art of pharmacy. As a part of his collegiate training and to inculcate the faculty of observation and deduction, every student in pharmacy should have assigned some topic of pharmaceutic interest for special study, investigation and report, even though these subjects be but very elementary problems in pharmaceutic research.

Notable events have a marked influence in stimulating the character of research and the results achieved. The foundation of a school of pharmacy in America for the systematic education of pharmacists had a decisive effect in the development of such characters as Daniel B. Smith and Dr. George B. Wood, and this event was the stimulus to which may be attributed the preparation of that masterwork, the United States Dispensatory.

The introduction of the process of displacement made the subject of percolation and the preparation of the various classes of galenicals by this method, topics demanding extensive experimentation, and as a result we have recorded the classical investigations of Procter, Squibb, Diehl, Lloyd and others as contributions of great practical worth to pharmacy.

The events of the Civil War presented new opportunities for pharmaceutical research and the further development of such pharmacists as Maisch and Squibb. The southern States were compelled to rely much upon their natural resources. To meet this necessity Dr. Francis P. Porcher wrote his book on "The Resources of the Southern Fields and Forests, Medical, Economical and Agricultural," and this work is still frequently referred to as an authority. Dr. Charles Mohr, a southern pharmacist, likewise made many valuable scientific investigations of the natural products and resources of several of the southern States and his contributions to our literature are of practical value to medicine and pharmacy as well as to botany.

The organizers of the American Pharmaceutical Association in 1852 had in mind as main purposes, the improvement of the quality of drugs imported and the better education and protection of pharmacists. The objects announced suggested research, and this organization has ever since been the nucleus around which has been gathered the principal research workers in pharmacy, and its publications have been the mediums for disseminating the far-reaching results.

The great World War forcefully demonstrated the necessity for coördinated scientific research, applicable to the industries as well as to modern warfare. As a war measure, the National Research Council was organized in 1916 primarily for the purpose of stimulating and coördinating research on war problems. In 1918, by executive order of the President of the United States, this was reorganized as a permanent body, and the announcement was officially made that "its essential purpose is the promotion of scientific research and of the application and dissemination of scientific knowledge for the benefit of the national strength and well being." It is now chartered as the National Academy of Science. Despite the far-reaching possibilities and effects of pharmaceutical research and the im-

portance to mankind of a thorough knowledge of all remedial substances, and that pharmacists are the logical persons for the carrying on of such investigations, it remains a fact that so far pharmacy has not been recognized in the plans of the National Research Council, and that there is no evidence that pharmaceutical research is to be given any encouragement.

The thorough study of the numerous medicinal products supplied by pharmacists, and the processes employed in securing and preparing medicines will open up boundless fields for study with innumerable research problems, the possibilities of which and the value thereof to mankind cannot be estimated. Suffice it to proclaim that "the sum of scientific knowledge for the benefit of the national strength and well being" acquired thereby, will hold no secondary place.

The practical issue at this time and the important question before American pharmacists is how pharmaceutical research can be systematized and organized so that the importance of the coöperation of this branch of scientific investigation will be fully recognized, and an appropriate place in the scheme of the National Research Council be assigned to pharmacy.

The field open to pharmaceutical research is now not more restricted than formerly, but on the contrary is continually expanding and it is but a fair inference to assert that the value of the past investigations can be more than duplicated by those of the future. There is no lack of opportunity for pharmacists to engage in study and research, and the present generation should not let the imputation rest that there is now less desire. An observing writer has recently stated that pharmacy has never been more in need of research upon strictly pharmaceutical problems than at the present time.

There is scarcely a topic associated with the practice of pharmacy on which the available knowledge can be said to be complete. Innumerable are the questions requiring further study arising from the natural kingdoms and all quarters of the globe from which medicines are obtained. The methods and processes employed in pharmacy are not yet sufficiently understood, and despite all the work done on percolation, and all that has been written thereon, the last word has not yet been spoken. The value of the various solvents and their appropriate use in the extraction of different drugs is still an open question meriting further extensive investigations involving in each drug a study of its active constituents and their behavior to solvents *in situ* and after extraction. The revisions of our national standards, the Pharmacopoeia and National Formulary, call for continuous research along many lines. The tests and assay processes are constantly undergoing revision and must be considered on the whole as tentative and requiring much further review and improvement. The botanical source of some of the official vegetable drugs is still undetermined even though these may have been in use for many generations. The proper time for collection of vegetable drugs and the approved methods for their preservation; drug plant cultivation, the effect of soil, climate conditions, altitude, etc.; the percentage of active constituents and the study of the localization of these in the respective plants remain fertile fields for study. The voluminous and excellent work of such men as Tschirch, Oesterle, Moeller, Dragendorff, Flückiger, Koch, Zörnig, Hanbury, Holmes, Greenish, Collin, Maisch, Kraemer, Bastin and Trimble in developing the knowledge of pharmacognosy and plant chemistry, but serves to demonstrate

the vastness of the field yet unexplored. The enzymes; the ferments; the vitamines; the animal organ drugs, such as the endocrine gland products; the synthetic chemicals; as well as the new remedies that are being continually introduced into medical practice, present an endless variety of topics demanding the attention and investigation of pharmacists. The textbooks, and even the legally recognized official standards, contain statements that are in need of verification, and it is an imperative duty that these be critically examined and that each erroneous or misleading statement be either corrected or eliminated.

In citing these various lines of research open to pharmacy, it must be understood that I have offered these merely as examples and not as an enumeration of the extensive field of exploration available for the application of systematic pharmaceutical research.

The need is that pharmacists themselves, as well as scientists engaged in other fields of research, should have a correct view of the possibilities and the comprehensiveness of pharmaceutical research. The investigations properly coming under this classification have many points of contact with other fields of research, and therein is the need for coördination and coöperation, and the reason why pharmacy should be properly represented in any plans for national scientific research. The problems arising in the laboratory of the manufacturing pharmacist are, of course, important and should receive searching study and investigation, but not from a selfish standpoint alone. His problems can best be solved by coöperation not only with his fellow manufacturers, but by that of research workers in the sciences involved in the questions at issue, and the benefits of such research belong to "the national strength and well being." However, to limit pharmaceutical research to such a narrow field would be to have it serve only the selfish ends of a few.

Many of the problems arising in pharmacy are of a chemical nature, but to limit pharmaceutical research to chemical problems would be a very narrow construction. Likewise, it is important that the pharmacologic action of synthetic remedies should be carefully studied and their therapeutic value accurately defined, but to limit the field of pharmaceutical research to such pharmacological investigation, as was at one time proposed, evidences a lack of conception of true pharmaceutical research and its proper scope. True, all of these and many more lines of scientific investigations are points of contact and coöperation of pharmacists with other research workers. Pharmacy research cannot, however, be classified with medicine, nor with chemistry or with any of the other lines of research so far recognized. It performs a distinct duty to the public and should be accorded recognition as a distinct vocation with problems of national interest and welfare peculiar to its field of service. All of the propositions for pharmaceutical research that have so far emanated from those outside of pharmacy have only demonstrated the insufficiency of the view, and a failure to comprehend the extensive fields awaiting organized pharmaceutical research.

Pharmacists themselves must have a proper conception of the present and a broad vision of the future possibilities. The salvation of pharmacy and its establishment upon a solid basis as a profession founded upon scientific studies and investigation, rests entirely upon the pharmacists themselves. The investigations of the past have been largely carried on by the individual workers engaged

as teachers in the schools of pharmacy, or as experts in the laboratories of the manufacturers, and by a few retail pharmacists. There has been no systematic attempt to coördinate pharmaceutic research or make it a coöperative division of a national comprehensive research plan. Pharmacy has been like an ocean-going steamer with good engines and compass, but no navigator. We must now realize the changed condition of the times resulting partly from the war necessities, and partly from the advanced position assumed by those who have been placed in charge of the National Research Council. This organization is composed of those associations or societies that have as a basis for membership, research. Consequently, if pharmacy would seek a part in the scheme of this coöperative national movement, it must organize its research committee, association, or section composed of the workers and those interests in pharmacy that are concerned in research, so that scientific pharmaceutic investigation will be stimulated and properly directed.

It would appear that the American Pharmaceutical Association is the proper body to organize pharmaceutical research, that it may be assigned to its proper field of usefulness and correlated in the scheme of the National Research Council, and the Committee on Research is charged with this duty. The American Pharmaceutical Association is acknowledged to be the scientific support of the drug industries and the organization of research must now become another means of exhibiting its leadership and useful activity in behalf of pharmacy. It must hold aloft the torch of learning and transmit the knowledge acquired from the contributions of the past with increased brightness and added store and energy to the future generations.

Upon the colleges of pharmacy we must rely for support. Not only should their faculties be composed of enthusiastic research workers capable of carrying on scientific investigation, but every student in the higher or post-graduate courses should be given training in original investigations of problems pharmaceutic. This is a feasible plan by which the work of the past can be perpetuated and the needed army of research workers in pharmacy may be gradually built up of the proper material.

In closing permit me to refer to the Biological Exploration of the Amazon Basin under Dr. H. H. Rusby. While the newspapers have very commonly spoken of this as an expedition of chemists, it is organized, controlled and financed by pharmacists, and to a very large degree it is a pharmaceutical research expedition, and is typical of many more extensive pieces of research that would become feasible under an organized pharmaceutical research endowment.

"We all have personal responsibilities in things outside our own individual lives.

"The great art—the great art of human relationships—must be considered and practiced by every man in business to-day. We must hang together with the other fellow in order to bring things out right. It has been every man for himself which has given us our profiteers and human gougers. It must be *every man for the next fellow as well as himself* which will bring us into the condition of right human relationships without which no amount of spot prosperity will help.

"Get into the get together spirit and see how it works.

"It does."—PAULL HAYDEN, *N. Y. Commercial.*

PHYTOCHEMICAL NOTES.*

No. 85. The Monarda Oils of 1918 and 1919.

BY D. C. L. SHERK.[1]

Monarda punctata, 1918.—An oil amounting to 170 grammes was distilled August 25th from the leaves and stems of the plant, chiefly. It was of a rather dark, reddish brown color and had deposited, at the time it was examined eight months later, a crystalline layer. The heptane test (precipitation of hydrothymoquinone) was applied and the density determined, an assay made by the phenol extraction method, and the phenols separated.

Another sample amounting to 90 grammes was obtained from ripe and long dried flower heads. It was rather darker in color than the first.

Monarda punctata, 1919.—A quantity of fresh herb in full bloom was distilled October 15th from the Florida variety grown in the Pharmaceutical Garden of the Experiment Station. The yield was 0.1055 percent, which was increased by cohobation to 0.1574 percent. The oil was clear and of a bright brownish color. The density and phenol content of the original oil and each cohobate were determined separately.

A sample cultivated at the Highlands when harvested weighed 95 lbs. It was allowed to dry and distilled after a time. The yield of original oil on the dry basis was 1.496 percent and on the green, 0.645 percent. Cohobation raised that to 2.707 percent. In working up this oil by cohobation a blue aqueous layer was obtained.

Two samples of herb were collected at Lone Rock. The first sample, designated "baled," was collected by mowing the field and raking all of the dried material and baling it in a press. This was distilled at Madison and contained much foreign material; probably one-third was Monarda. The yield of oil indicated this also. The yield was increased somewhat by cohobation in this case. The oil was of a pale yellow color with only a slight reddish tint. The cohobated portions were distinctly reddish in color.

The second sample was baled before it became thoroughly dried and some fermentation set in before drying was completed after opening the bales. The leaves had turned brown and almost black, and an overwhelming odor of thymoquinone developed in the mass. The chief foreign material in this was sandburs.

Monarda fistulosa, 1918.—A quantity of oil amounting to 1715 Gm. was obtained from plants overmature, distilled August 23 and 24. When examined one crop of crystals had been removed from this oil and another was forming. It was of a very pale yellowish color, bright and clear, and was the lightest oil examined among those from the two crops.

Another oil had been obtained from plants fully mature, distilled somewhat earlier, August 8. The quantity obtained was 237 grammes in 0.32 percent yield. It was very dark brown and the red color was almost entirely lacking in this oil. It was free from any deposit.

From long dried and ripe flower heads 58 Cc. of oil were obtained having a reddish brown color.

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* From the laboratory of Edward Kremers.

[1] Fritzsche Brothers Fellow, 1919–1920.

Monarda fistulosa, 1919.—The material was collected at various stages of development from early flowering to complete flowering and was divided into two lots. One had been freed from all foreign material such as weeds, grass and dead stalks; while the other portion had not been sorted in this manner. Both lots were distilled after drying and the aqueous distillate cohobated repeatedly until reduced to a small volume. These cohobated oils were collected separately and the density determined, and assayed.

These oils were of a reddish brown color, bright and clear. That from the sorted material is designated "cleaned" and was used for extraction of phenols from alkaline solution with ether in the attempt to isolate the methoxyl constituents present in these oils.

The results on these oils are shown in tabular form:

OILS OF *Monarda Punctata.*

Date.	Description of material.	$D_{20}°$ Westphal.	Phenols. Dilute KOH (5 p. c.).	Remarks.
8-25-18	Leaves and stems	0.947	62.5 p. c.—heptane equal vol.	Crystalline layer, crystals from heptane.
1918	Ripe and dry flower heads	0.937	53.0 p. c.—heptane equal vol.	Crystals from heptane.
Florida var. from garden 10-15-19	Plant green and in full flower	0.9149	46.7 p. c.—oil direct 45.9 p. c.	Yield direct 0.1055 p. c., cohobated 0.1574.
	1st cohobation	0.9668	88.9 p. c.—10 Cc. oil, 2 87.6 p. c. Cc. heptane	.....
	2nd and 3rd cohobation	0.971	94.2 p. c.—10 Cc. oil, 2 Cc. heptane	.....
Highlands Sample	Dried herb	0.9212	60.0 p. c.—oil direct 60.6 p. c.	GREEN DRY Yield: 0.645 p. c. 2.496 p. c.
	1st cohobation	0.970	91.8 p. c.—10 Cc. oil, 2 Cc. heptane	Cohob.: 0.684 p. c. 2.707 p. c.
Lone Rock "Baled"	Mixed with grass	0.9246	.....	Yield dry original, 0.8275 p. c.
	1st cohobation	0.9714	89.4 p. c.—10 Cc. oil, 2 Cc. heptane	Yield dry cohobated, 0.9479 p. c.
	2nd and 3rd cohobation	0.9750	95.4 p. c.—10 Cc. oil, 2 95.9 p. c. Cc. heptane	.....
Lone Rock "Fermented"	Entire plant	0.9295	56.6 p. c.—oil direct	Yield dry original, 2.101 p. c. Yield cohobated, 2.346 p.c. This material had fermented.
	1st cohobation	0.9677	87.2 p. c.—10 Cc. oil, 2 87.8 p. c. Cc. heptane	
	2nd and 3rd cohobation	0.9747	95.7 p. c.—10 Cc. oil, 2 Cc. heptane	Density of another lot of the original oil, 0.9305.

OILS OF *Monarda Fistulosa.*

Date.	Description of material.	$D_{20}°$ Westphal.	Phenols. Dilute KOH (5 p. c.).	Remarks.
8-23-18	Over-mature plants	0.916	45.25 p. c.	2nd crop crystals in oil cryst. from heptane.
8-18-18	Mature plants	0.924	44.5 p. c.—heptane equal vol.	No crystals in oil, or from heptane. Yield of oil 0.32 p. c.

1918	Dry and ripe flower heads	0.952	44.0 p. c. — heptane equal vol.	No crystals in oil, or from heptane.
1919 Cleaned material	Entire plant	0.9402	64.0 p. c.—oil direct 62.0 p. c.	Yield original, 1.638 p. c. (dry) cohob., 1.859 p. c.
	1st cohobation	0.9700	90.2 p. c.—oil direct 89.6 p. c.	.....
	2nd cohobation	0.9755	96.0 p. c.—heptane 95.4 p. c. added afterwards	.....
	3rd and 4th cohobation.	0.9768	95.4 p. c.—5 Cc. oil 95.6 p. c.	.....
1919 Residual material	Entire plant	0.9396	72.4 p. c.—10 Cc. oil, 5 71.2 p. c. Cc. heptane	Yield, original dry 1.724 p. c.
	1st cohobation	0.9750	90.0 p. c.—oil direct 89.6 p. c.	Cohobated, dry 1.947 p. c.
	2nd cohobation	0.9763	98.5 p. c.—10 Cc. oil, 2 98.5 p. c. Cc. heptane	.....
	3rd and 4th cohobation	0.9770	98.2 p. c.—10 Cc. oil, 2 97.9 p. c. Cc. heptane	.....

Cohobation of Aqueous Distillates.—The distillates resulting after the separation of the oily layer had been discarded, usually, but it is apparent that it contains almost all of the more readily soluble constituents of the oil and represents a saturated aqueous solution of whatever appears in the oil. Since the solubility of some of the oxygenated constituents of volatile oils in water is not insignificant, an attempt was made to recover them by redistilling repeatedly the aqueous distillates obtained from the herb. Where large quantities of herb are distilled this represents a large volume of water amounting to about a liter per kilo of dry herb. In every case about a third of the water was distilled over and the oil thus obtained separated. Of this distillate a third again distilled over until the volume became manageable. The oil only was examined from these cohobations. The first cohobated oil naturally contained the oil that had been incompletely separated from the first distillation and may be considered as a true cohobated oil contaminated with more or less of the original oil. The succeeding portions of oil were more carefully separated and represent more truly the nature of the portion of the oil soluble in water. Possibly the most soluble constituents of these oils are these phenols. Hence density determinations and assay indicated that the latter oils are practically pure phenol.

Thus, for instance, the yield of oil from green and fresh *M. punctata* in full bloom (Florida variety) was increased by one-half by cohobating the distillates three times.

Original oil	112.5 Gm.	0.1055 p. c.
Cohobated oil	55.3 Gm.	0.0519 p. c.
Total oil	167.8 Gm.	0.1574 p. c.

On a dried sample the difference was not so great and amounted to only about 10 to 15 percent of the original oil. Because of the high phenol content of the cohobated oils, their color is always distinctly reddish and some of the *punctata* cohobates could be readily induced to solidify.

With *M. fistulosa* much the same results were obtained and the yield of oil was increased about 15 percent on dried material.

A study of the tables of specific gravity and phenol assay indicates that the oils recovered by cohobation are almost pure phenols and that while the recovery of oil may be 15 percent or so, the recovery of phenols may amount to from 25 to 35 percent, a factor of some significance for these oils.

	M. punctata.		*M. fistulosa.*	
	Density.	Assay.	Density.	Assay.
Original oil	0.9295	56.6 p. c.	0.9396	71.8 p. c.
1st cohobation	0.9677	87.5 p. c.	0.9750	89.8 p. c.
2nd and 3rd cohobation	0.9747	95.7 p. c.	.....	....
2nd cohobation	.....	....	0.9763	98.5 p. c.
3rd and 4th cohobation	.....	....	0.9770	98.1 p. c.
The phenols	0.977	....	0.9777	....

Monarda punctata.

Oil sample.	Direct.	1st cohob.	2d and 3d.	Total.
Florida variety	112.5 Gm.	38.0 Gm.	17.3 Gm.	167.8 Gm.
Highlands	278.0 Gm.	17.0 Gm.	6.5 Gm.	301.5 Gm.
Baled	965.0 Gm.	94.0 Gm.	46.0 Gm.	1105.0 Gm.
Fermented	1614.0 Gm.	142.0 Gm.	43.0 Gm.	1799.0 Gm.

Monarda fistulosa.

Sample.	Direct.	1st cohob.	2d cohob.	3d and 4th cohob.	Total.
"Cleaned"	1865 Gm.	170 Gm.	54 Gm.	27 Gm.	2116 Gm.
Residual	3010 Gm.	259 Gm.	90 Gm.	44 Gm.	3403 Gm.

The Heptane Test.—The dilution of Monarda oils with heptane is frequently followed by the deposition of crystals of hydrothymoquinone and it was felt that a development of this test might lead to its establishment as of practical value for these oils. Frequently oils of *M. fistulosa* deposit crystals of hydrothymoquinone and an oil of *M. punctata* is found to do this occasionally. When, however, the oil is diluted with an equal volume of heptane a clear solution is not obtained, but the turbidity changes after hours to a crystalline deposit in almost every case. Of course, water may cause a similar turbidity. With oil of *M. fistulosa* exposure to cold has very slight effect on the amount or nature of the deposit, but with oils of *M. punctata* where hydrothymoquinone does not form so frequently as with the other oils, exposure to low temperature (—25° C.) results in the deposition of thymol in rhombic crystals with characteristic markings.

The test was applied to all of the oils examined for 1918 and 1919. The original oils of *M. punctata* for 1918 were treated with an equal volume of heptane in small quantity, about 5 Cc. The oil "8-25" had already deposited a layer of crystals and more formed in heptane; while the other oil deposited crystals only in heptane. None of the 1919 oils could be induced to deposit crystals except at reduced temperature when thymol came out.

The oils of *M. fistulosa* not infrequently deposit the crystals readily in the oil, and almost invariably on dilution with heptane. However, one of the 1918 oils from the mature flower heads, containing only about 44 percent phenols, gave only an opalescence on the glass and no crystals formed. All of the other oils examined gave deposits. The cohobates of the oil designated "cleaned" were subjected to this test also. The original oil gave crystals at dilution of one volume, and an additional precipitate at a dilution with two volumes of heptane

At one volume none of the three cohobates deposited any crystals at ordinary temperature but at two volumes the second cohobate was induced to deposit a few; though in every case a turbidity resulted on the first dilution, which increased with the second dilution.

A MORE PRACTICAL ASSAY PROCESS FOR SOME U. S. P. ZINC SALTS.*

BY GEO. E. ÉWE AND FRED GLOOR.

The burdens of this communication are to emphasize the impracticability of the sulphide method of determining zinc in some U. S. P. zinc salts and to suggest the substitution therefor of the more practical ferrocyanide titration method.

The difficulties surrounding the application of the sulphide method are familiar to every analyst. The chief difficulties are the lack of assurance that the precipitation is complete, the necessity of allowing the precipitate of zinc sulphide to stand with warming for at least eighteen hours in order to complete the precipitation and obtain the precipitate in a sufficiently coagulated form to permit it to be collected on the filter and, most exasperating of all, the difficulty of properly washing the precipitate after it has been collected on the filter. The precipitate is usually so slimy that it is only with the exercise of the most extreme patience that proper washing can be effected at all. In addition to these difficulties, there remain the non-assurance that the treatment of the sulphide with nitric acid is really dissolving out all of the zinc (and that it is not being occluded by the clumps of sulphur formed by the reaction) and the persistence of some of the finely divided sulphur in passing through the filter with the possible production of varying small proportions of sulphate or sulphide in the weighed zinc oxide.

The accuracy of the sulphide method is above question where precise results are required and the proper precautions are observed to obtain these results, but where practical results are desired in a minimum of time the ferrocyanide titration method is infinitely superior.

The U. S. P. zinc salts which are now directed to be assayed by the sulphide method and to the assay of which the ferrocyanide titration method is applicable are the acetate, phenolsulphonate, sulphate and valerate. In addition, it is preferable to assay the chloride and the metal by this method.

The details of the ferrocyanide titration method, as found practicable in this laboratory, are as follows:

Standard Solution Potassium Ferrocyanide.—Dissolve 40 Gm., roughly weighed, of potassium ferrocyanide in enough distilled water to obtain a yield of 1000 Cc. Mix well and standardize as follows: Weigh accurately about 0.3 Gm. of chemically pure metallic zinc; place the weighed zinc in a beaker; dissolve it in 10 Cc. of U. S. P. hydrochloric acid; add about 100 Cc. of distilled water; neutralize with ammonium hydroxide; make barely acid with U. S. P. hydrochloric acid and add about 3 Cc. excess of the acid; add 10 Cc. saturated solution of ammonium chloride; heat nearly to boiling and titrate with the standard solution of potassium ferrocyanide, using a 5% solution of uranium acetate or nitrate acidified with

* Read before Philadelphia Branch, A. Ph. A., January meeting, 1921.

a few drops of U. S. P. hydrochloric acid, as a "spot" indicator on an opal glass plate. The end reaction is the production of a brown colored "spot" on the plate. Calculate the volume of standard solution used into terms of metallic zinc to which each Cc. of standard solution is equivalent. Time can be saved in standardizing and in making assays for zinc by first running a rough test in order to ascertain the approximate volume of standard solution which will be required, and then in making the actual assay, running in about 1 Cc. less than will be required and finishing the titration by adding 0.1 Cc. at a time and testing by the "spot" test after each addition of the standard solution.

In applying this method of assay to the zinc salts mentioned above, the salts are dissolved in a minimum of water, then 10 Cc. of U. S. P. hydrochloric acid are added and the assay proceeded with as in the determination of the strength of the standard solution.

The application of this method to the assay of metallic zinc merely involves a repetition of the standardization procedure.

The ferrocyanide titration method is extremely short, requiring less than one-half hour for duplicate assays after the standard solution of potassium ferrocyanide has been standardized, contrasted with at least the full day required by the sulphide precipitation method. The ferrocyanide titration method has the additional advantage that the presence of lead exerts no influence on the results, whereas the sulphide method includes any lead which may be present.

The accuracy of the ferrocyanide method is without question, since it is primarily based upon standardization by a definitely known quantity of chemically pure metallic zinc.

In order to ascertain if the acetic, hydrochloric, phenolsulphonic, sulphuric and valeric radicles of the U. S. P. salts of zinc, to which it would be desirable to apply this method, would have any appreciable influence on the accuracy of the method, the following experiments were conducted:

Zinc Acetate.—Definite weights of Baker's chemically pure metallic zinc were dissolved in hydrochloric acid and acetic acid, in small excess of the theoretical proportion which would be present if zinc acetate equivalent to the metallic zinc used were present, was added. Triplicate assays yielded 100.3% of the weight of metallic zinc employed, so that it can be safely stated that the acetic radicle of zinc acetate exerts no appreciable influence on the results obtained by the ferrocyanide titration method and therefore this method is applicable to the assay of zinc acetate.

Zinc Chloride.—The present U. S. P. method for the assay of this salt is inaccurate, since only the chloride radicle is determined and calculated into terms of zinc chloride. Since free hydrochloric acid is usually present in zinc chloride, determination of the chloride radicle yields high results. The ferrocyanide titration method is applicable to the assay of this salt since it merely duplicates the method of standardizing the standard solution of potassium ferrocyanide and is preferable to the present method, since it is based upon direct determination of the zinc.

Zinc Phenolsulphonate.—A commercial lot of U. S. P. zinc phenolsulphonate assaying 100.6% of crystallized salt by the U. S. P. sulphide method yielded 100.4% crystallized salt by the ferrocyanide titration method. Four other com-

mercial lots of this salt assayed 104.5%, 99.43%, 98.7% and 99.25% crystallized salt, respectively. It appears likely that the lot which assayed 104.5% had lost some of its water of crystallization. Three experiments with chemically pure metallic zinc dissolved in hydrochloric acid to which sufficient phenolsulphonic acid was added to represent that which would be present if the zinc had originally been present as phenolsulphonate, yielded 99.5% of the amounts of metallic zinc used. Therefore the ferrocyanide titration method appears to be applicable to the assay of this salt.

Zinc Sulphate.—The experiments outlined above under zinc acetate were repeated, using sulphuric acid in place of acetic acid. Several assays yielded 99.6% of the weight of metallic zinc used. A commercial lot of this salt assayed 102.9% crystallized salt by this method; the high assay indicating a loss of water of crystallization. Therefore, the ferrocyanide titration method appears to be also applicable to the assay of zinc sulphate.

Zinc Valerate.—The experiments outlined above under zinc acetate were also repeated using valeric acid in place of acetic acid. Triplicate assays yielded 100.4% of the amount of metallic zinc employed. This method is, therefore, applicable also to the assay of zinc valerate.

Zinc U. S. P.—Since the determination of the strength of the standard solution of potassium ferrocyanide is based primarily upon the use of a definite amount of chemically pure metallic zinc, the ferrocyanide titration method, of course, is perfectly applicable to the assay of U. S. P. metallic zinc.

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MEXICAN HERBS AND DRUGS.*

Noticing in the pharmaceutical press that a number of medicinal vegetable raw products have been received from the secretary of the British Trade Board of Mexico, and were on view at the chemical section of the Overseas Trade Department, at 35 Old Queen Street, Westminster, the writer paid a visit there in order to see if any of them presented possibilities of use in this country. Mr. T. W. Rogers, the gentleman in attendance, most courteously permitted me to peruse all the information that had been provided concerning the specimens, but unfortunately this information was of the scantiest character, even the names of the plants being in several cases incorrectly spelt, and the specimens apparently selected without the advice of either a scientific or trade expert, or without intelligent supervision. The specimens consist of seventy boxes, about 3 by 3 by 2 in., containing about an ounce of herb or root in each, and consequently insufficient material for botanists in this country to identify them with certainty if previously unknown to them. A small number occurring also in Europe, such as *Ocimum basilicum* (Albahaca), *Foeniculum vulgare* (Hinojo), *Matricaria chamomilla* (Manzanilla comun, or M. del Pais), *Ruta graveolens* (Ruta), *Rosa centifolia* (Rosa de Castile), were so badly prepared that they certainly could not compete with the same herbs as sold in Europe. The majority of the samples of purely Mexican drugs exhibited had nothing to recommend them as superior to the drugs or herbs of other countries.

* E. M. Holmes, F.L.S., in *Chemist and Druggist*, January 8, 1921, p. 52.

One would have expected to find some of the Mexican drugs and economic products that have attracted attention in commerce during the last fifty years or have found new uses, such as the Mexican "scammony," *Ipomea Orozabensis*, or Queretaro jalap (*Ipomoea triflora*) and "Diabetol" leaves, which have for 200 years at least been used in Mexico as a remedy for diabetes; or *Chaparro Amargosa*, attributed to *Castela Nicholsoni* ("Y. B. Pharm.," 1918, pp. 205, 230; 1919, p. 189); or *Casimiroa edulis*, which Merck called attention to (see "Year Book of Pharmacy," 1902, p. 171), and of which an illustration of the plant and twenty-seven pages of text (pp. 111–138) are devoted in the second part of Mexican Materia Medica (1898). One might also reasonably have expected that a copy of the Pharmacopoeia Mexicana and of the "Annales del Instituto Medico Nacional" and of the "Datos para la Materia Medica Mexicana," containing descriptions of the medicinal plants and their uses, might have accompanied the specimens sent for reference for the use of visitors, especially as these works are officially published by the Secretaria de Lomento, Colonizacion é Industria, and could have been obtained without difficulty. A singular illustration of the British method of doing things in bureaucratic positions is given in the bare list of names supplied in the catalogue. A bark labelled "Tlaxlacal" has no botanical name or identification attached, but only this significant sentence: "Six cars of this bark are said to be sent away every month by Germans." Yet the taste of the bark and its color should reveal to any intelligent observer that the bark contains much tannin, and belongs to the few tanning materials having very little coloring matter of which oak bark, mimosa bark, and neb-neb pods are examples, and it would therefore be of considerable commercial importance. The very fact that Germans were utilizing a product in quantity should have led to commercial information concerning it and its botanical identification for British use being obtained. Canaigre root (*Rumex hymenocephalus*) is one of the few important tanning materials that have not escaped notice, but as a regular article of exportation it would be difficult to overlook it. Candelilla wax, a wax possessing properties similar to carnauba wax, is another. The majority of the herbs and roots do not appear to possess any special qualities to recommend them to the attention of either business or scientific men, and one wonders why they were sent; while there are others, which suggest possible extensive uses, such as the Yerba del Algel (*Eupatorium collinum*), used as a substitute for hops in beer, or the Yerba de la Cucharaia (*Macrosiphonia hypoleuca*), the powder of which is used as an insecticide for the American cockroach.

It can, however, be easily understood that herbs with such names as Yerba del Vibora (*Myriadesmus tetraphyllus*) and Yerba del Cancer should have seemed worthy of investigation, and, owing to the facts that the former, instead of being used for snake-bite, is employed as an antiperiodic, and that the latter name is applied to so many plants in different districts—*e. g.*, *Lythrum vulnerarium* and other species, *Gomphrena decumbens*, *Salvia indica*, and *Acalypha phlocodes*, etc.—that it would be difficult to get the same herb twice under the same vernacular name. The specimen of Yerba del Cancer sent is certainly a labiate plant, and might possibly be the Salvia which is used in Guadaljira. A similar difficulty would attend the importation of Mexican herbs having names identical with, or similar to, those of European herbs. Thus Poleo is not Pennyroyal, but a form of *Mentha*

arvensis, which is used in Mexico as a substitute for it. Oregano is not *Origanum vulgare*, but is a verbenaceous plant, *Lippia origanoides*, which is also called Origano del Pais and Origano de Tehuacan. The small heads of flowers are about the size and shape of those of *Origanum majorana*, but the leaves are more rigid, are reticulated with prominent veins underneath, and are not downy. The taste resembles that of thymol and carvacrol, and it might be of interest to examine the essential oil. The Azafran sent is not saffron, but the florets of *Carthamus tinctorius*, and should properly have been labelled "Azafrancillo," which is the name for the drug.

Peonéa, of Mexico, is *Cyperus esculentus*, but the specimen sent, although bearing that name, is unquestionably not that root, but that of the *Poeonia officinalis* of Europe. It is obvious, therefore, that better supervision should have been exercised, and the collection submitted to a scientific botanist, and commercial expert in drugs, before being sent to this country.

There are, however, a few of the drugs or herbs that deserve notice.

"Estafiate" is the name given to *Artemisia Mexicana*, Willd., which is one of the plants illustrated and fully described in the Mexican Materia Medica, pt. 2, pp. 95, 110. In this work it is stated to contain santonin in the flowers, and that the extracted active principle agrees with European santonin in all particulars. If this statement be confirmed, there should be no difficulty in cultivating the plant in British Colonies in the Tropics.

Another Mexican drug that might be worth attention at the present time is Lycopodium, which is produced from *Lycopodium clavatum*, in Orizaba, Oaxaca, etc., especially if it can be obtained free from the adulterations, talc, pollen, dextrin, starch, etc., used for that purpose. Tepopote or Yerba del carbonero, consisting of three or four species of *Baccharis—viz.*, *B. Alamani*, D.C., *B. multiflora*, H.B.R., and *B. conferta*, H.B.K., nat. ord. *Compositae*—has a high reputation in the treatment of coryza. These species contain resin and essential oil, but in an allied species, *B. cordifolia*, a narcotic alkaloid has been detected by M. Arata, which he named "Baccharanine." Another herb, Acalhuatl, or Arnica del Pais, *Heterotheca inuloides*, Cass., is of interest only because it might possibly enter commerce under the name of arnica. The plant is illustrated in the "Materia Medica Mexicana," pt. 2, p. 141, and could evidently be recognized by its different phyllaries and much more numerous florets. A chemical examination of the plant did not reveal any alkaloid or glucoside, but only tannin and an acid resin, and its therapeutical properties were found to be *nil*.

The juice of the Yerba de la Golondrina (*Euphorbia maculata*, Linn.), known also as Celidonia del Pais, is used, like that of *Chelidonium majus*, to remove spots on the corner, and as an application in ringworm and other skin diseases.

The sample of Peyote labelled "Anhalonium Lewini," is certainly not that species, although apparently one allied to it.

The root of Molle de Raiz (*Agave Americana*) is used for washing cloth and silk material, but the Molle de Bolita, the fruit of a series of *Sapindus*, is probably richer in saponin. It is curious to note that *Anagallis arvensis*, the common scarlet pimpernel of this country, is used for the same purpose in Mexico. Nothing is more clearly evident from these samples than the fact that until Great Britain selects her consuls and commercial agents from the most intelligent and pains-

taking classes of the community, she cannot hope to retain commercial pre-eminence. Such positions should be filled, not according to political influence, but with regard to commercial and scientific knowledge and *savoir faire*.

THE USE OF DRUGS IN DISEASE.*

BY R. G. ECCLES, M.D., BROOKLYN, N. Y.

To how many of your minds has the idea come that pharmaceutical chemistry may be the oldest profession on the earth? The first of living things must have started as a drug compounder. As soon as the early Protozoa began colonial life—*i. e.*, when they changed from one-celled to multi-celled organisms—they must have exchanged with one another those kinds of drugs now known to physiologists as hormones. With progress upward to the higher forms of life we find, on study, that the exchange of drug commodities increased very greatly. Myriads of substances unknown to the lower forms appear among the higher. Prof. Huxley, the great English biologist of the end of last century and the beginning of this, declared that of the many millions of organic substances produced by plants and animals they are all combinations of exactly the same elements as are found in "smelling salts" with a trifling amount of mineral substances. Out of these cells—the primitive pharmacists—produced by their compounding almost the entire array of organic substances found upon your shelves labelled with what laymen look upon as hieroglyphics. While most pharmacists know, in a general way, that the great bulk of their medical supplies are the products of these ancient pharmaceutical chemists few have stopped to consider the fact that their own bodies are miniature drug depots, and that a quite respectable proportion of the drugs found therein vary but slightly from those they sell every day over their counters. The same identical radicals are found in them as are found in the store stock. Your bodies' cells have been licensed by nature, after a proper training in the nature of drugs, to put up the claim that within their membrane walls "Prescriptions Are Carefully Compounded." Within their walls they are constantly at work filtering, precipitating, dissolving, macerating, digesting, percolating, oxidizing, reducing, and hydrolyzing. An inventory of the kinds of goods they carry—not ready made, however, but as chemical radicals—would be astonishingly like those found in a Jersey pharmacy. There are in the cells of a normal human body material radicals for the production, on demand, of some very potent compounds but all so cared for as to be quite harmless. Let us, for a moment, look over part of the list as it occurs to us at first thought. There is phosphorus, phosphoric acid and phosphates; iron, iron oxides, sulphides, sulphates and carbonates; sulphur, sulphides, sulphates, sulphites, sulphurous acid, sulphuric acid, and sulphuretted hydrogen; ammonia, ammonium carbonates, sulphides, sulphates, sulphites and phosphates; nitric and nitrous acids with a host of nitrogen salts, t. n. t., nitroglycerin and dynamite; hydrocyanic acid, cyanogen, cyanates and cyanides; iodine, iodides, iodates, and thyroidine; arsenic acid, arsenic, arseniates and arsenides; formaldehyde, formic acid, formates and many polymers of formaldehyde; glycerin and a host of different kinds of tryglycerides; hydrochloric acid, chlorine and a multitude of chlorides; calcium,

* Read before New Jersey Pharmaceutical Association, Newark, 1920.

calcium chlorides, carbonates, sulphates, sulphides, and a multitude of organic calcium compounds; unnumbered substances carrying the benzol ring; fluorine, hydrofluoric acid, and fluorides; alcohol, acetone, acetaldehyde, acetic acid, and acetates of many kinds; citric acid and citrates, oxalic acid and oxalates, oleic acid and oleates; potassium and its salts; sodium and its salts, silicic acid and silicates; copper and its salts; manganese and its salts; etc. In amido-valerianic acid there is the radical for production of valerianic acid and valerianates. The nucleic acid contains the raw materials of phosphorus, phosphoric acid and phosphates, hydrocyanic acid and cyanides, as well as of glucosides. The proteins hold in their structures three amino acids that contain the benzol nucleus, namely, phenylalanin, tyrosin and tryptophane. These are the mother substances of carbolic acid, benzoic acid, salicylic acid, benzaldehyde, aniline and numerous aromatic substances that perfume our drug stores, to say nothing of malodorous skatol and indol. These three amino acids are found in every cell of the human body but are particularly abundant in hair and nails, skin and mucous membrane. Every tissue that is exposed to infection by parasites, to an unusual degree, contains more than those not so exposed. They, with cystin and cystein, that contain oxidizable sulphur, are, strange to say, the first of the amino acids released by trypsin in the bacteria-laden intestine. There they produce the well-known antiseptic substances named and particularly carbolic acid. There the danger of having the cell-foods—the amino acids—stolen by saprophytes and parasites is greatest for these organisms subsist and fatten, as do the cells, on these amino acids. The oxidation of cystin, by bacteria, produces sulphurous acid, an antiseptic about as powerful as carbolic or benzoic acids which it fortifies. It seems as if nature had set a trap for the parasites by which they injure themselves as a cheese-set trap catches mice. Meats, fish, eggs, milk, glutin, and the like, all contain an abundance of these bacteria-inhibitors that only act when being digested or putrefied. The odor of skatol in putrid food is evidence of the fact that the bacteria are, by their depredations, producing antiseptic substances to inhibit their activity. The tyrosin is abundant in melanins, the pigments of the negro's *rete mucosum*, the choroid coat of the eye, and in the hair. With the approach of old age the hair turns gray, the nails brittle, and the eye-sight dim because of a shortage of tyrosin and its oxidizing enzyme, tyrosinase. Skin affections also increase as melanin diminishes. The black skin of the negro accompanies his relative immunity from yellow fever, malaria and trypanosome disease as compared with the lack of immunity in white men. Darwin has pointed out that certain skin diseases of animals attack only unpigmented ones, leaving the pigmented untouched, while piebald animals are attacked only on white spots. The shortage of tyrosin seems to be responsible. Millions of years ago the phenylalanin and tyrosin of plants were buried in the ground with the plants that produced them. We now dig them up as coal and the aromatic radicals of these amino acids constitute the antiseptic substances of coal tar. Our beautiful anilin colors and our many new synthetic remedies have come from these. Their antiseptic powers have preserved them for all these years from the depredations and ravages of time. We, too, like coal, derive our antiseptic radicals from plants as no animal seems to possess the power to produce them, in spite of the fact that none can live without them.

Among the first of well-known men to proclaim the virtues of these substances, as found in coal tar, was George Berkeley, Bishop of Cloyne, Ireland, who died in 1753. You have all no doubt heard his prophetic slogan, that has become a household expression: "Westward the course of Empire takes it way." You probably also know that California has honored him by calling the university city of that State by his name. He extolled tar water as a panacea for many ills and this, together with his then unpopular philosophy, brought ridicule upon him. Pope, the great English poet, however, came to his defense and in one poem says:

"Truth's sacred fort the exploded laugh shall win,
And coxcombs vanquish Berkeley with a grin."

His supposedly erratic defense of tar water has been vindicated by modern research, and the scriptural claim that "The leaves of the trees shall be for the healing of the nations" is also vindicated. In these leaves are, and always have been, produced the world's supply of the best-known parasiticides and antiseptics. All of our food proteins are leaf products, so far as they contain phenylalanin and tyrosin, as are also all coal tars, so far as they contain the benzol nucleus. Through this discovery we are but beginning to see that throughout living nature a battle with parasites is going on in which these constitute the implements of war. To successfully vanquish individual diseases we must pursue the methods of nature in the way it holds in abeyance the countless millions of actual and potential disease-producing parasites that menace all other living things. The way she controls disease we must control it, and the weapons she uses against microbes we must use, in order to be successful. Fifty years ago little was known of these invisible foes, and a century ago only the larger parasites had any place of recognition in our textbooks of medicine. Now we have discovered them to be the constant enemies of every thing that lives. There are now catalogued from 5 to over 20 different kinds for each particular species of plant and of animal. Over sixty have been catalogued and named as enemies of the oak trees. Not a single soul within the hearing of my voice is, at this very minute, free from them. We are all disease carriers. Streptococci, staphylococci, pneumococci, and *Bacillus coli communis* are now waiting upon, and within our bodies, for some favorable opportunity to start disease. They are being held at bay by the antiseptic substances we have named as present in skin and hair, mucous membrane and nails. A scratch of the skin may inoculate the apparently trifling wound with some virulent kind of streptococcus that starts erysipelas and kills us. We stop its multiplication by a free use of exactly the same radicals as the skin that was removed contained. Our supply, however, most likely came from coal tar in which it had lain for many milleniums since the plants that produced it were menaced by still other kinds of parasites. With the advancement of bacterial and chemical knowledge we are, as such cases show, getting rid of empiricism and discovering broad, general laws of treatment that are as sound to-day as they were when, in the carboniferous era, these substances were formed. Unfortunately, there are among us a large number of people who measure progress by the yard-stick of their own ignorance. Knowing nothing of discoveries that lie outside of their studies they look, with unfeigned terror, on any kind of change that does not correspond with the opinions of their great grand-dads. They cling to old fads

and fancies as they do to truth when they happen to possess it. Not laymen alone are guilty of this folly. It is quite common among physicians and pharmacists as well. We are all loath to give up ideas that we took in when babes and sucklings. We have little of the bravery of the pioneer, and dread, with undisguised fear, every innovation that collides with our early impressions. Medical science has entered a new path since our discovery of the cause of disease and we are now being called upon to remodel our ideas in respect to processes of cure. In the confusion that is resulting from this change we are witnessing an intense conflict of opinion between progressive and sessile, or conservative, minds. Remarkable as is the fact, too, the conservatives have chosen for themselves the title "reformer" as they seek, with might and main, to reform things backward.

Among the new so-called reformers are those who seek to stop the use and manufacture of vaccines, those who oppose research in physiology and therapeutics, calling the processes pursued by the name of vivisection and themselves anti-vivisectionists, and those who oppose all drug treatment and condemn it as wholesale poisoning. The creed of the latter is that all drugs are "deadly" poisons and all administration of drugs is poisoning. From their point of view poisons are poisons inherently, and it matters not whether the dose is large or small it poisons in proportion to the amount given, the result being cumulative. This, of course, is a very old notion as well as a very false one, if we can rely on the experimental evidence of modern science. This view, however, has during the last two decades made immense progress in the minds of both laymen and doctors. It has built up a host of therapeutic nihilists, who want to "cast physic to the dogs." It was the inspiring thought among those who demanded the abolition of the use of alcohol in every possible form. It is instigating a crusade against the use of tobacco, tea, coffee, etc. Can you not see where this sort of logic is traveling and what the final result is likely to be unless we can educate the mass of voters to alter their views, in some safe degree, in this craze? Should these emotionalists increase in numbers as fast in the next century as they have done in the past what is likely to happen? Would it astonish you much if, when they feel that they are strong enough, they should raise the cry of "Stop Poisoning the Sick?" They would have no trouble in finding, in medical literature, an abundance of thoughtless utterances, of able medical men, to confirm their contention and win votes enough to close drug stores as they have closed saloons. Take, for example, these two statements, one from *Bulletin* 30 of the Committee of One Hundred on Public Health, p. 88, and the other from a State Board of Health *Bulletin*, as a statement from a leading medical college professor of New York:

"It would scarcely be an exaggeration to say that the first rule of hygiene is to avoid poisons."

" 'ALL POISONS:' All of our so-called curative agents (drugs) are poisons and, as a consequence, every one diminishes the vitality of those who take them."

These views are an echo of the time when men conjured out of their inner consciousness what they called truth. An appeal to nature by actual experiment would quickly have convinced them that so far are they from being true that, under proper qualification, the very reverse is declared by nature to be true. Not one of those who make statements like these has any knowledge of what a

poison is or why it poisons. It does not occur to them that among the most poisonous substances known to man are such foods as beef, chicken, fish, egg, breads, and proteins generally. Notwithstanding their poisonousness we could not live unless our food contained them. In the *Journal of Infectious Diseases*, Prof. H. G. Wells, of Chicago University, tells us that when egg-white, in a perfectly pure condition, is injected into a rabbit's circulation, in two intermittent doses, very minute amounts kill. He says: "One fifty-thousandth of a cubic centimeter of a solution containing but one-millionth of a gramme of protein (egg albumin) sensitizes fatally." (Oct. 20, 1908, p. 456.) That certainly beats strychnine. When these food substances are taken by the mouth the digestive fluids convert them into amino acids that are perfectly harmless. If they enter the circulation partly digested fatal results occur from what is technically known as anaphylaxis. It is now believed that all the various symptoms of different kinds of diseases are due to the anaphylactic poisoning of the body substances by the dead parasites that are being digested in the blood stream. A poison is, so far as we at present know, a substance that has an affinity for some of a cell's molecules and that by union with such molecules produces fatal disturbances in metabolism. The cells are all surrounded by specific membranes composed, as now believed, of protein-like substances. Injury to these, by union with chemicals that damage their function, alters their semi-permeability and leads to cell-death. Egg-white is broken up in the circulation into relatively large molecules of what we may call polypeptids and these have different affinities for different cells but are too large in size to take a proper place in metabolic changes. They act like a monkey wrench thrown between the cog-wheels of a machine. Meat, when partly broken up, has an affinity for a different set of cells from that chosen by egg-white fragments. Fish has still another set of such affinities. The proteins of microbes have, under the same circumstances, still other attractions for different cells and each kind of microbe poisons, with its protein fragments, different kinds of body cells. Hence different diseases display different symptoms. These microbe proteins, so far as we know, behave, when fully digested, exactly as do meats, fish and eggs—they nourish our bodies. Only at a certain stage of partial digestion are they poisonous. The most deadly toxins of disease have been fed to animals by the mouth, in relatively large amounts, without a sign of poisoning. They are digested into harmless and nourishing amino acids. The toxin of botulism is an exception that is probably composed of molecules sufficiently small to be able to pass into the circulation undigested and, therefore, able to produce anaphylactic poisoning. The deadly cyanogen glucosides behave in a similar manner to proteins but they are not digested by the enzymes of the blood if introduced hypodermically. In the alimentary track hydrocyanic acid is released as a poison. In the circulation none of the cyanogen seems to be released and all of the molecules, if in reasonable amounts, are removed by the kidneys. These glucosides, therefore, behave in an exactly reverse manner, so far as their poisonousness is concerned, to that of the food proteins.

All so-called poisons appear to possess specific affinities for different kinds of cells just as do the poisons let loose from foods in anaphylaxis, and these are but particular cases of the general rule in all food substances. The bone cells attract a large share of the lime of the circulation. The liver cells take up most of the

free sugar and deposit it as glycogen. The thyroid cells take charge of most or all of the iodine. The cells of the choroid coat of the eye drag in a large share of the melanin. In the same way the nerves that supply the extensor muscles accumulate lead and produce, thereby, wrist-drop. The neurons of central vision have an affinity for something in tobacco that leads toward dim vision and blindness. Horses that have fed on tobacco leaves suffer, because of this, from amblyopia. Methyl alcohol breaks up, in the circulation, into something that acts on these same neurons producing blindness. Digitalin and aconitine act particularly on the heart muscles. Curarine acts on the termini of the motor nerves. Adrenalin acts on the terminations of the sympathetic fibers. Caffeine has a particular affinity for the kidney and muscle cells. Formaldehyde by linking itself to the aminogen groups of the protein is supposed to arrest metabolism. Ether, chloroform, cocaine, morphine, codeine, and heroine have an affinity for lipoids, being soluble in them, and through this solubility are thought to be able to act on the nerves of sensation, stop their functioning, and abolish consciousness of pain, locally with some and generally with others. In quite small amounts these substances all seem to have but a slight stimulating effect upon the cells that they reach and act upon. A judicious use of digitalis, or of digitalin, strengthens the heart muscles to which they appear to be attracted. A similar use of atropine or belladonna tones and strengthens non-striated muscles, stimulates the respiratory centers and increases intestinal peristalsis. Strychnine is attracted to, and acts upon, the vasomotor and motor centers of the cord, thus increasing the circulation and producing thereby a general tonic effect, through increased supply of arterial blood. These, and all other so-called poisons, when given in proper amounts, act upon special parts of the body—not to injure them—but to increase their physiological tone. When animals, and even unicellular organisms, are exposed to them they acquire immunity to their toxic effects, to a most extraordinary degree. Prof. Roger, in his "Medical Pathology," states that an amoeba "can be gradually habituated to water containing 2 percent of sea salt; it becomes so accustomed to the new conditions that it perishes when again brought back into ordinary water" (p. 79). Parks, in his work on "Pathogenic Bacteria," tells us that bacteria can be habituated to carbolic acid, if administered in sufficiently dilute solutions, so that, in time, they are able to use it as a food (p. 26). Kobert, in his "Practical Toxicology," says: "The smallest snail will withstand more strychnine than an adult man. Many of the stronger cardiac poisons have no action whatever on insects. The rabbit can take more morphine than can a man fifty times the animal's weight. Doses of lead, nicotine, cysticine, etc., sufficient to poison man fatally do not injure the goat. Amygdalin does not affect dogs, but it kills rabbits. The hedge-hog takes with apparent enjoyment a dose of cantharides that will kill several persons under excruciating pains. Whereas, the frog is extraordinarily susceptible to the digitalis poisons, they have no affect upon the toad" (p. 5). The mongoose is not affected by a snake bite. The California oil fly develops in crude petroleum oil. Prof. C. Pichet has shown that in such cases as he has studied "The law is established that in simple analogous substances toxicity is increasingly greater as the substance considered is found the less abundantly in nature" (*Chem. Abs.*, Feb. 20, 1911, p. 714). Habit in the use of the poisons, like habit with arsenic, alcohol,

morphine, tobacco, etc., probably has something to do with such effects. The cells are toned up to a new standard. In vaccination, and serum treatment of disease, the stimulation of cells leaves them able to resist greater amounts of the toxins of such diseases. The anaphylactic effects of different proteins and the susceptibility to most kinds of diseases vary with experience. After one attack of typhoid fever the second attack, if it comes at all, is likely to be very much milder. The cells become more resistant. Prof. H. M. Richards states that: "It has been established that many, if not all, classes of substances which exert a toxic action on protoplasm will become stimulating if presented to the cells in sufficiently small doses" (*Nature*, March 24, 1920, p. 115). Prof. Pfeffer, in his "Physiology of Plants," says: "Submaximal doses of many and perhaps all poisonous substances accelerate respiration, growth, and the production of heat" (Vol. 1, p. 264). Prof. Davenport, Director of the Department of Experimental Evolution, of Carnegie Institute, reporting his many experiments with poisons on plants, says: "It is clear from this table that the addition of even small quantities of innutritious and poisonous substances may so affect the hylogenic processes as to cause twice, or even far more than twice the normal formation of dry substances in a given time, and that this excessive growth increases with the concentration of the poisonous substances up to a certain optimum beyond which growth declines again to below normal" (*Proceedings A. A. Advancement of Science*, 1907, p. 504).

Without the subtoxic effects of adrenalin on the circulation the arteries could not function normally and without thyroidine, growth is arrested and health seriously impaired. Without hydrochloric acid how would gastric digestion proceed? In such cases it is evident that what we call poisons have a very important place in physiology. There is a universal law seen in all living things. It is the benefit derived from normal effort, normal heat, normal electric currents, and normal chemical stimulation. Within proper limits all of these are beneficial. It is only when their stimulation exceeds such limits that they become harmful and this harmfulness is evident in all of them. The muscles are strengthened by massage and by effort. The skin of hands and feet thicken with work. Heat, in proper amount, favors growth as toxic substances do. Just as digitalis strengthens the weakened heart, so all poisons strengthen such parts of the organism as they act upon, provided, of course, that the physiological maximum is not exceeded. When will the world take to heart this lesson and use it for our benefit? When will we all learn that a sick man is always a poisoned man? The anaphylactic effects of the poisons of typhoid give us the clue to the particular parts of the system that need toxic toning against such poisons. The anaphylactic effects of malarial poisons give us a similar clue to the parts of the system that require toning against these poisons. When we know enough to experimentally follow these clues, for all sorts of diseases that we suffer from, and that kill us, we will know how to do by every one of them as we do now with digitalin in weakened heart. Such knowledge will put us on the way to true prophylactic medicine.

To know how, during threatened epidemics, and at other times, to strengthen every susceptible cell against that particular kind of disease, will be to enter into a new era of preventive medicine. To-day we are "locking the stable door when the steed is stolen." Then we will be locking the door before the thief can enter.

Our present efforts in preventive medicine have wrought miraculous results but they are all centered upon environmental prevention. If "an ounce of prevention is worth a pound of cure" in one direction it should be in the other. Nature is showing us many ways by which to resist the poisons of microbes. Let us learn our lesson from her. We must become able to poison our poisoners and to inhibit the effects of their poisons upon our cells. The druggists have a duty here that is as great as that of the doctor. He should discourage all reckless talk about the poisonousness of drugs by teaching his customers, when he has an opportunity to do so, that there are no such things as poisons *per se*, that strychnine, in proper physiological amounts, is no more a poison than is bread or meat, egg or cheese, and that soluble poisons, properly diluted, are more likely to be beneficial than harmful. Unless this is done there may, at any time, arise a wave of ignorant hysteria that will destroy—as it has already hampered and hindered—medical science in its work of aiding the deluded men and women who are sponsors for restricting and troublous laws.

NOTES ON PRIMITIVE PHARMACEUTICALS, SUGGESTED BY THE BRONZE SEALS, OR AMULETS, FROM INDIA, WHICH HAVE BEEN ON EXHIBITION AT THE NEW YORK COLLEGE OF PHARMACY.*

BY ADELAIDE RUDOLPH, NEW YORK.

These seals, originally numbering seven, have given rise to a good deal of speculation. Nobody, yet, has been able to say definitely whether they be wholly religious in character, and the figures which are inwrought in their bases merely symbolic of deities worshipped by certain Hindu sects, or whether they belong to the more general class of amulets, which are still so largely used in India as a protection against witchcraft, sickness, accidents, and other evils and ills of life.

Miss Lucia C. G. Grieve, who lent them to the library, a member of the American Oriental Society and at one time a student of Sanskrit, thinks that they are mostly religious and symbolic in character. It was during a two-year residence at Satara in the Maratha country of the Bombay Presidency of India that she made the collection, buying the seals from time to time of the itinerant fakirs, or "boxwallas." The story told her about these particular seals was, that they had formerly belonged to priests who officiate at the sacred tanks and holy bathing places, to which pilgrims flock throughout the length and breadth of the country, and were, when heated, used by these priests to stamp upon the bodies of the pilgrims, after ablutions, a mark, which could not be lost or stolen, that should protect from the much dreaded "evil eye," and from other disastrous influences.

The two or three Hindus of New York to whom I showed the seals were inclined to support Miss Grieve's opinion—that they are purely religious and symbolic in character, though they discredited the part of the story which relates to branding the flesh. They thought it more likely and more conformable with Hindu customs in general that the stamps should be used to impress symbolic designs on the sandal-paste, or the clay or mud from sacred rivers or bathing

* Read before Section on Historical Pharmacy, A. Ph. A., City of Washington meeting, 1920; seals and amulets were exhibited.

places, with which good and devout Hindus decorate their faces, especially the forehead between the eyebrows, after the bath. This explanation of their use seems to accord also with their present appearance, because one can see the remains of some pasty or chalky substance still clinging to the bronze. The custom, however, prevailing in Burma, of *tatooing* the body with mystical squares, cabalistic diagrams, and weird figures for charms[1] does not by comparison make the brief *branding* of such figures seem "too cruel to be believed." In Burma, also, charms are often embedded in the flesh.[1]

The real difficulty in interpreting their character and use appears when one studies the figures. To what particular god or goddess of the Hindu pantheon are the centipede, the beetle (or, it may be, a conventionalized scorpion), and the square and pentacle sacred? The conch, probably, is religious and symbolic; for we find in a paper, published in the *Journal of the Anthropological Society of Bengal*, 1907, p. 79, that the "*sankha* or conch" is one of the symbols of Vishnu, and of his eighth incarnation, Krishna, and is impressed by means of a copper or brass seal on a particular kind of earth which is believed to be the relic of the sandal-paste prepared by the milk-maids who were the attendants of the god Krishna and his beloved Radha. On the other hand, conchs are used sometimes, apparently, merely as charms. In the Madras country, Miss Grieve saw conchs placed on the headstalls of the oxen, which she notes in parentheses are the "steeds *par excellence* of that region," to protect them from the evil eye.

So, too, with regard to the "pentacle," composed of two triangles. The triangle in varying combinations is used by the *Shaktas* (whose bible is the Tantras). Many of that sect live in and about Satara, so that articles used by them would frequently come into the hands of peddlers. Yet, two triangles interlaced or superposed in the form of the pentacle constitute a stock figure of the magical art among many peoples who are still in a condition of primitive culture. One writer says that, in Bombay, when the pentacle is enclosed, as is the seal which we have, in a series of circles and curves, it prevents a child from crying; also, that it is used as a charm against scorpion stings and fever.

Of what religious import, if any, are the characters neatly wrought in the square? Nobody yet has been able to tell us, because nobody yet has been able to say whether they are numbers, letters, or signs. It looks very much like those "magic squares," which are so common, which contain numbers, or letters and signs for numbers, that, added, give the same sum-total in every direction—up, down, or across the sides, or diagonally. Magic squares are much used in India as specifics for diseases. A Hindu writer in the *Journal of the Anthropological Society of Bombay*, 1910, gives a list of forty-four amulets of this character, which his father, in 1862, had him copy out of a much esteemed commonplace book. "To me," he says, "the sole interest lies in the fact that the amulets here shown in figures are from the collection of my dear Father who had great faith in their efficacy." Some were prescribed to be worn, others to be put into the bed near the afflicted patient, and others to be written on paper and the water drunk in which they had been washed.

The incantation, or charm, inscribed in Marathi on the heart-shaped stamp which looks like a seal ring, may be easily read by one who knows the language.

[1] Hastings, "Encyc. Religion and Ethics."

It recites the holy name of Rām (Rāma), than which no name is held more sacred throughout India. But was it used simply as a distinctive mark of an ecstatic follower of the renowned hero of the Rāmāyana and the seventh incarnation of the god Vishnu, or was it to be used or worn as a charm to protect one against diseases and other evils? "A Rām '*kavac*' [amulet] is worn in a gold case, usually by females, for protection against evil spirits, who cannot face the name of Rām," says a writer in one of the *Memoirs of the Asiatic Society of Bengal, 1906.*

Of course, for accuracy, questions like those above ought to be answered more definitely before we appropriate these particular seals for our showcase as examples of the forerunners of modern pharmaceuticals. We may, however, contend that religion and the healing art were so closely connected in the beginning that the means for cultivating either are often hardly distinguishable. Were not priests the earliest physicians, and the sanctuaries of the gods the earliest hospitals? So, naturally, the prayers and objects offered to the gods in praise and thanksgiving would come to be regarded as able to protect from harm the worshipper who offered them—a sort of boon for return service, you understand. If so, may we not use these seals as illustrative of the earliest forms of drug store paraphernalia, even though these particular ones were not designed for such purposes?

Even the copper, or bronze, of which the seals are made has been held, not only sacred, but remedial in character from time immemorial—possibly reminiscent of the wonderful impression made on the men of the Stone Age by the introduction of copper for utensils, implements, and what not, which ushered in the Age of Bronze. They must even have tried to shackle the "Stone-Age demons" of the diseases which hurt them most, with bands of this wonderful new material; for a tradition seems to have persisted, going back to some such distant period of time, that rings of copper worn in the ears, or on the arms or legs would cure rheumatism. In the Punjab, India, they say that copper ear-rings will scare away the spirit which brings sciatica. And here, in America, I can boast of having among my acquaintances an intelligent and well-educated woman, who wore a copper band, welded close about her upper arm, to cure rheumatism of the shoulder. Somebody had prevailed upon her to try this old popular specific; and, though skeptical at first, she was almost convinced finally that it did do some good. At least she suffered no more pain in her shoulder.

We may recall that many of the magical objects mentioned in medieval lore were said to have been made of brass. The fly was of brass with which Vergil (reputed as a great necromancer in the Middle Ages) expelled every fly from Naples by setting it up on the city gate.

And this leads us into the subject of sympathetic magic or medicine, which the centipede and other representations of insects or vermin on the seals might illustrate. "Like produces like, or an effect resembles its cause" is a good homeopathic doctrine, which has obtained, apparently, among all peoples of primitive culture. It was the image of a fly with which Vergil frightened the flies away from Naples. The Persians, it is said, scare away cockroaches by writing the name of the cockroach king "Kabikaj" in places infested by his subjects. In the library at Cambridge, England, may be seen a Persian manuscript thus defended against their attacks, this royal name being inscribed thrice on its cover.[1] A patient

[1] C. W. King, "Talismans and Amulets," *Archaeol. Jl.*, 4, 26, 1869, p. 235.

bitten by a dog used to eat the hair of a dog. A person stung by an adder was advised to kill the animal, or else to fry the adder and strike the place bitten with the hot flesh, or else to make an ointment from its liver and apply it locally. A cure for the scorpion's bite may be conjectured from the following verses:

'Tis true a scorpion's oil is said
To cure the wounds the vermin made.[1]

What more likely, then, than that the figure of the centipede branded into the flesh should afford an enduring protection against the bite of that poisonous creature, which infests the houses of India, and that the other figures, whatever they represent, should act as exterminators of their kind in the same way?

To cut this paper short, then, which, on such a subject, might be prolonged to any length—may we not still keep these seals in our showcase as suitably illustrative of the earliest pharmaceuticals and the forerunners of all departments of a modern drug store?—the centipede and other insect figures, to represent vermin exterminators, roach salts, etc.; the pentacle and conch shell, baby's rattle and other sundries; the magic square and inscribed charm, the worthy, or unworthy ancestors of the prescription department? Even the cosmetics and face powders will be represented, if we consider the use to which the stamps are put as regards decoration, which reminds me to say that it is believed that all decoration originated in fear, and was considered prophylactic before it was regarded as purely ornamental.

Allow me a final note—in admonition to the trade:

Do not let the "consumers" of your communities know how easily they could cut down the H. C. L., not only by wearing their old clothes another two years, but by adopting such primitive pharmaceuticals as are still cultivated by a goodly portion of the population of India—that great and mysterious country, so authoritative among Westerners for its efficiency in occultism.

THE NEXT STEP IN PHARMACEUTICAL EDUCATION.*

BY R. A. LYMAN.

On September 1, 1923, all schools of pharmacy holding membership in the American Conference of Pharmaceutical Faculties have agreed to advance their entrance requirements to a four-year high school course. The National Association of Boards of Pharmacy have also fixed that date as the one on which they will require a four-year high school course as a prerequisite for taking a board examination. Credit is also due to the latter association for having recommended this date several years earlier than that finally chosen by the Conference. The Boards also deserve the highest praise of all true friends of pharmacy for having at their last meeting passed resolutions fixing definite dates in the near future when they will require, in addition to the high school requirements, registration in and completion of a two-year course in pharmacy as a prerequisite to an examination for the practice of pharmacy. It is hardly necessary to say that practi-

[1] Max Kahn, "Vulgar Specifics and Therapeutic Superstitions," *Pop. Sci. Monthly*, 1913.

* Presented before joint session, Section on Education and Legislation, A. Ph. A., American Conference of Pharmaceutical Faculties, and National Association of Boards of Pharmacy, City of Washington meeting, 1920.

cally all of the state universities have already gone to the four-year high school requirements and some of the private schools have done likewise, or have served notice that they intend to do so before the final date set by the Conference. It is to be hoped that all institutions will decide to go to a four-year high school basis before 1923.

These changes in educational requirements have been declared by some to be too rapid and visionary but compared to advances made in professional lines other than pharmacy, they are slow. Be that as it may, these advanced requirements indicate that pharmacists are waking up to the fact that in order to save professional pharmacy we have got to move rapidly. Pharmacy seems to have been the last profession to realize that its function is to render a special service to society and that special service is not to supply a lot of cheap help to merchants. Neither is it to keep alive a lot of schools operated for commercial reasons.

Now that the four-year high school requirement is about to become effective, the pertinent question has been asked, "What is to be the next step in pharmaceutical education?"

I have noticed a tendency in the Conference, on the part of some of its members, to rest on their oars for a time after the putting into effect of each higher requirement. This has been so when the effort made was such a simple thing as increasing the requirement by one high school year. Certainly no one who has a real interest in professional, scientific, or even commercial pharmacy, will argue that this is the time for us to be indifferent toward pushing the requirements of pharmaceutical practice to a higher plane. None of the related professions are now oar-resting in this respect. And unless pharmaceutical requirements are advanced much more rapidly in the next few years than they have been in the past, pharmacy will continue to trail at the tail of the other professions—picking up the odds and ends that the other professions have overlooked or cast aside as unfruitful. Pharmacists will still be looking for something "professional" to do. The brains of the student body of America will continue to enter other fields of activity where there is something worth while to do. Only the brainless—those who are content to hang around a drug store for three or four years, washing bottles, scrubbing floors, polishing soda fountains, will constitute the student body, pharmaceutic. A fine prospect!

The war did one thing for pharmacy. It showed us just where pharmacy stands in the family of the learned professions. In order to qualify as a S. A. T. C. school it was necessary that a four-year high school course be the standard for entrance. On many occasions during the war and since, we have been told that the reason why pharmacy did not receive proper recognition was because of the inadequate educational requirements. While some were inclined during the war to maintain that the plight in which pharmacy found itself was due to politics, it is a significant fact that since that time many of those who maintained that attitude have devoted their attention to the advancing of educational standards. Furthermore this progressive attitude is reflected throughout the country in recent legislation, which in almost every instance has tended toward the advancing of educational requirements.

I shall attempt to answer only briefly the question as to what our next step

should be beyond the four-year high school requirement. There are certain steps which seem to me to be necessary in order that pharmacy may keep pace with the related profession. We may differ as to the best methods of bringing about the desired results but as to the necessity of making certain changes, I think there can be no question. Again, in making the following suggestions I have in mind only the question of placing pharmacy on a par with the other professions and am not concerned with the producing of cheap help for employers or the prolonging of the life of any school within or without the Conference. On many previous occasions I have stated that professional pharmacy would be benefited if cheap help was unobtainable and if many of the schools now in existence should die. I have found nothing in the course of events to change that opinion.

I. Now that we have fixed the date for the four-year high school requirement to become effective, I believe the next important step is to eliminate our short courses in pharmacy. Certainly everyone will agree that a scientific pharmacist cannot be trained in two years. No one could be made to believe that an expert chemist could be made in two years. Four years are only sufficient to ground the student in the fundamental principles of chemistry and the sciences related to it. If a chemist cannot be made in two years how can a pharmacist be properly trained in that time? His work must cover a much wider field. Every one who has any vision of the future of pharmacy will say that a pharmacist cannot be properly trained in less than four years. The large manufacturers of medicinal products have a contempt for the average pharmacy college graduate, and why? Because the average college graduate has not had enough training to enable him to do anything. This can only lead the manufacturers to have contempt for the average college of pharmacy. I believe that no one values a well-trained man more than the big manufacturer. He is looking for the well-trained man, not the cheap man. He wants the man that can do things and is willing to pay almost any price for such a man. The time has come when a four-year high school course and a four-year technical college course should be the minimum educational requirement for any profession.

II. A matter of equal importance is that of apprenticeship. The present system of drug store apprenticeship is an abomination to the progress of pharmacy. I am not discussing the value of the apprenticeship system of a quarter of a century ago. It was an entirely different matter then, but it has served its purpose. No intelligent boy is going to hang around a drug store for a period of three or four years where he has about as much opportunity to learn pharmaceutical science or the conduct of a pharmaceutical business as he would if he were a boot-black in a barber shop. The fact that a boy is content to stay in a drug store for so long a time when there are such opportunities in other lines of work, is a sure sign of deficient mentality or lack of ambition. Yet he represents the material we must draw upon to build a profession. I am frank to admit that a two-year college course is much too long to spend upon a boy who has such an outlook upon the opportunities of life in this age of great opportunity. I have, through the pages of the *Druggist Circular*, upon a previous occasion, stated that this apprenticeship system is the factor which is responsible for turning

away from pharmacy those young men with brains which we must keep if pharmacy is to live. I can only repeat this now with emphasis.

The tendency in recent legislation seems to be to solve this problem. The States which have recently enacted new pharmacy laws permit graduates of a four-year course in pharmacy to register without so-called "store experience." If we are going to require "store experience" let us work out a system where we may have a year of intensive, practical experience after the school training is completed. Such a year might correspond to the year of hospital interneship now being required by some medical schools. But let it be a scheme which will give to the student a real training in the practical application of his professional work. The object of such an interneship must be to make the student a more efficient pharmacist rather than to give the proprietor a cheap man for one year.

III. Another important step in education which should come soon is a classification of the colleges of pharmacy and the establishing of standards for these colleges; their methods of instruction and their teaching faculties. I am told by an officer high in authority in the government service, that the chief reason why pharmacy received so little attention during the war was because of the low educational standards maintained by the schools located in certain eastern states. If this is so these colleges have a serious responsibility to bear. The matter of qualifications for teaching in colleges of pharmacy is a problem which has frequently been brought before the Conference. And always very pleasantly and happily dismissed. It is a fact that in the case of many Conference schools there are men holding positions upon their faculties who have no academic qualifications and who would not be permitted, because of this fact, to hold a position upon the faculty of any other college of the university. In other words, these men lack that breadth of training which is a most necessary factor in any modern educational institution. A teacher of pharmacy to-day must have a horizon that is not limited by the four walls and ceiling of a drug store. Only men of broad training and wide interest can place pharmacy in a commanding position. There are too many men posing as educators who are of the drug store calibre. The institutions having men of this type should see to it that they are replaced as early as possible by men properly trained.

IV. The introducing of modern methods of teaching pharmacy should be one of our chief concerns. Of course these methods will come with the employment of a different type of men. I know of some Conference schools which still teach dosage by having the class repeat doses in concert. Pharmacognosy is taught by passing a dozen containers filled with crude drugs about the class room. The first time around the name is attached; after that the student must know or find out the contents of the container without a label. Such methods could hardly be called pedagogically scientific. Neither do they give the student any training. They do not lead him to think and can only tend to belittle the whole science of pharmacy in his opinion.

V. One of the most serious problems that faces pharmacy is the lack of pharmaceutical literature, both journals and textbooks, and especially the latter. When one looks over the pharmaceutical texts now published and compares them with texts published in other lines, the comparison is painful. Some of the recently published texts are a disgrace to the profession—all the more so because

the individuals writing them are capable of producing something better. Someone has said that the quality of the textbooks published is a fair indication of the development of a science. The condition is such in pharmacy that we ought to encourage in every possible way the writing and publication of texts by those who are, by training and experience, best qualified to do so. It is unfortunate that some of our best men who are highly qualified to write scientific books along their respective lines cannot confine themselves to their own special fields and thus produce scientific books of real value. We are not in need of a series of compilations of the United States Pharmacopoeia and all other departments of human knowledge. But we do need scientifically accurate books representing the various phases of pharmaceutical science. If I may be permitted a reference, in order to illustrate, I would mention the "Art of Compounding" by Scoville. Such a work is a credit to that branch of the science which it represents and to the author who wrote it.

VI. Finally as a part of our immediate educational program, pharmaceutical educators must stand for what is scientifically correct. The fact that a series of manipulations designated as "Homeopathic Pharmacy" exists, and has a large following, is no reason why we should teach this so-called Homeopathic Pharmacy in our schools. I have made a statement in another paper to be published soon, that pharmacy, in order to amount to something, must stand for something. There is no justifiable reason, other than commercial, for pharmacy to cater to every fad. In fact, I believe we lose even in a commercial way by so doing.

I believe it is a mistake to continue the National Formulary with its present policy. It is a collection of discarded drugs, therapeutically incorrect formulas, and substitutes for alcoholic beverages. It represents to a large degree the polypharmacy of former ages and is the garbage can of the Pharmacopoeia. Yet it is owned by the national association that is supposed to stand for the best in scientific pharmacy. I am thinking just now of the N. F. as an educational factor and I cannot see how the N. F. can be a factor in giving scientific standing to pharmacy. I believe its policy can be so changed that it will become a real factor for the advancement of scientific pharmacy and a credit to the pharmaceutical profession.

In this period of world reconstruction we have resting upon us the responsibility of reconstructing pharmacy. If it is not done at once by making the requirements for the practice of pharmacy comparable to those of the related professions it will be difficult to ever bring it about. It is difficult to discuss these matters frankly without seeming to speak harshly. If we are to attain the professional ideal which we seek, we must lay aside all personal feelings and ambitions and say and do the thing we believe necessary to say and do in order to consummate that ideal.

DEPARTMENT OF COMMERCIAL INTERESTS

CONDUCTED BY DR. ROBERT P. FISCHELIS.

A good way of judging one's personal methods of salesmanship is to pay close attention to the methods of the salesmen who come into the drug store, and then draw comparisons. The chances are that the sales methods which seem distasteful to the druggist are also distasteful to his customers.

Persistence is an important factor in making sales, but it can be overdone. Never make customers feel uncomfortable by insisting on their buying certain merchandise. It is the surest way of keeping them away from the store. You have met the salesmen of pharmaceutical houses who insist that there must be something in their line which you need, in spite of the fact that you have informed them gently, but firmly, that you are well stocked with everything. The wise salesman, under these circumstances, recognizes that you are not in a humor to appreciate his persistence, and leaves; but the overly persistent chap hangs on until your gentleness disappears and your firmness turns to wrath. On the other hand, the salesman who takes "No" for an answer immediately, and makes no further attempt to interest the buyer, lacks an element which is absolutely necessary to successful selling. The average person is interested in something new, something startling, or in the new application of some well-known product. Persistence in bringing these things to the attention of customers in a different way each time you have an opportunity to meet them is sure to bring results.

Cheerfulness and enthusiasm are essential features in sales work. The retail druggist should cultivate both. More than any other class of storekeepers, druggists must maintain a cheerful spirit because of the sorrow surrounding the homes and disposition of many of their customers. An encouraging remark, a cheery greeting, and a sympathetic attitude when the occasion requires it, will make fast friends of many customers who are otherwise indifferent. Cheerfulness and enthusiasm are contagious. Nobody is in a buying humor in an atmosphere of gloom.

Tact is a necessary attribute to every salesman. Someone has defined tact as "the unsaid portion of what you think." Happy is the man who knows what not to say at the proper moment. How easy it is to make some remark which will start a train of thought in the mind of the purchaser that leads far away from the objective of the salesman. Druggists, as a rule, know more neighborhood gossip than other business men, because they enjoy the confidence of a greater number of people. A good motto is to listen much and say little. Above all, never let a customer know that you have the slightest knowledge of his or her state of health through filling prescriptions. If customers volunteer information, it is another matter, but if you are in the habit of deducing ailments from the ingredients of prescriptions, do not deduce out loud. Patients often try to get information regarding their condition from druggists by asking questions about the prescriptions they are having filled. Side-stepping such questions requires tact, but it is absolutely necessary to use tact to avoid embarrassing the physician in any way. Nothing can be more harmful in the relation between

doctor and druggist than to have the latter discuss prescriptions with the patient and attempt to either support or criticize the doctor's judgment.

Persistence, cheerfulness, enthusiasm and tact are all necessary attributes for the success of the man behind the drug counter, but the greatest of these is tact.

WORLD WAR VETERANS IN THE INDUSTRIES.*

BY TAPPEN FAIRCHILD.

"The World War Veterans in the Industries" covers so wide a range, that even if I had systematically gathered the data, it would be an imposition upon your time and patience and interest for me to attempt anything more than a brief consideration of one phase of it. Naturally, my thought turns first to the particular group of industries in which chemistry plays its vitally important part, since my special interest and my daily work are directed along these lines. It was owing to my chemical training also, that I was fortunate enough to have the experience which qualified me to become a member of the World War Veterans' Section. For I was one of the large number of men who volunteered for service and were enrolled in the various organizations which later were consolidated into the Chemical Warfare Service. The efficiency of the work of this Service is effectually demonstrated, I think, in the fact that, while its purpose at the beginning was purely defensive, directed toward finding some means of protection against the deadly poison gases employed without warning by the ruthless exponents of modern warfare, it finally enabled us to take the offensive, to meet and beat the enemy with his own chosen weapons. As an instance, I might cite the attack on Lens in the Spring of 1918, during which two companies of the first gas regiment fired 2500 60-lb. bombs, each containing 30 pounds of liquid phosgene, on the enemy in the middle of the night. Such an attack produces a very great concentration of gas and is correspondingly deadly. Had the war gone on for a few months longer the enemy lines would have been literally drenched in gas, some of it far more deadly than anything which had been used up to that time.

In many instances the men of this Service on their return to civil life found that the work they had left had passed into other hands. Just how they have been placed by the Personnel Division of the Chemical Warfare Service in Washington I have no means of knowing, but this Service was reversed for their benefit, that is to say, it helped return them to the industries from which it had taken them.

It is interesting to note the many heads under which these men were divided according to the chemical work they were qualified to do in connection with the various industries. Some specialized in agriculture, making studies of fertilizers, of plant life; others devoted themselves to fuels; to mining, to iron and steel; to textiles; to organic and inorganic chemistry; assaying; dyestuffs; glass, etc., etc. There is practically not an industry to-day that can get along without a chemist, or staff of chemists, and we all know how closely the work of the chemist blends with the work of the pharmacist.

These chemists, these World War Veterans, are now probably widely dispersed all over the country, working as units for the most part; they are not organized, but each man, let us hope, is doing his work with the attention, the precision,

*Parts of an address before World War Veterans' Section, A. Ph. A., City of Washington meeting, 1920.

that brings results. It is pleasant to think of them as "carrying on" in civil life as they did during their period of military service, with the same thoroughness and determination, each a better man and a better worker on account of his experience. The work of the chemist is not always spectacular, but it is very important, for it reaches into all the details of life, the necessities, the comforts, the luxuries, everything that makes for the welfare and advancement of the human race.

We, who served in the world war, have abundant opportunity for patriotic service. Let us in every way possible exert our influence to bring about a just and reasonable peace between the captains of industry and the industrial workers, and promote harmony between these two great forces, who hold in their hands the happiness, the comfort and convenience of the people, the prosperity and progress of our country. I am confident that the returned army man can be counted upon to array himself on the side of law and order, which must prevail if we are to maintain the permanence and the security of the nation.

HISTORICAL DATA ON THE NAVAL STORES INDUSTRY IN THE UNITED STATES.*

BY W. O. RICHTMANN.

The products of the naval storage industry, as generally understood at the present time, consisting of turpentine, oil of turpentine, rosin, tar, and pitch, are of vastly greater commercial than strictly pharmaceutical interest. Nevertheless the first three, and a derived product of the fourth are official in the last revision of either the U. S. Pharmacopoeia or the National Formulary.

Through the courtesy of Daniel Hanbury, a copy of a publication entitled "Instructions for suche thinges as are to be sente from Virginia," was supplied to the American Pharmaceutical Association in 1871. This publication was dated 1610. Relative to turpentine, pitch and tar, we read the following:[1]

"Pyne trees, or ffirre trees are to wounded wth in a yarde of the grounde, or boare a hoale wth an agar the thirde pte into the tree, and lett yt runne into anye thinge that may receyue the same, and that wch yssues owte wilbe Turpentyne worthe 18L P Tonne. When the trees beginneth to runne softelye yt is to be stopped vp agayne for preserbingethe tree."

"Pitche and tarre hath bene made there and we doubte not but wilbe agayne, and some sente for a sample, your owne tournes beinge firste served."

That the expectation expressed there was not fully realized was evidenced from the following, under date of November 1627:[2]

"His Majesty is much troubled how little account can be given of any substantial commodity from the colony (Virginia), and how truly it may be said 'That this plantation is wholly built upon smoke, tobacco being the only means it has produced,' they are therefore, not only recommended but commanded to take special care in the making of pitch, tar, pipe staves, soap ashes, and potashes, iron and baysalt, to search for mines and to plant vines."

The Governor, council and burgesses of Virginia replied to the King in March 1628, relative to naval stores that "Materials in plenty for making pitch and tar are at hand."[3]

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*Read before the Section on Historical Pharmacy, A. Ph. A., City of Washington meeting, 1920.

[1] Proceedings A. Ph. A., 19, p. 491.

[2] "Calendar of State Papers—Colonial Series—1574–1660," p. 86.

[3] *Ibid.*, p. 89.

Progress was not rapid in the production of the above-mentioned products in Virginia or any of the other colonies during the 17th century. Efforts were made to produce them in the colonies to the north, as well as in the colonies to the south, as soon as they were settled. All of the territory from Virginia to Newfoundland was included in a report on the possible sources of production of these products in 1667.[1]

Several of these products were produced in New Hampshire, Massachusetts, New York, as well as Virginia, previous to 1700.[2] A common reference in the records of Massachusetts is to the effect that the salary of the preacher was frequently paid at least in part with tar.[3]

Owing to the fact that Sweden had established a complete monopoly in the tar and pitch industry, England passed an act of Parliament 1704–5 granting a bounty on all turpentine, rosin, oil of turpentine, tar, and pitch made in the colonies and shipped to England.[4]

This action undoubtedly did much to stimulate the industry and especially in the more southern colonies. In 1707, 4704 barrels of tar were received in England from the colonies.[5] North Carolina in 1718 led all the other colonies in the production of turpentine, rosin, pitch and tar. In 1719 a regulation concerning the proper packing of tar and pitch and providing for the appointment of packers "under oath" was made in South Carolina.[6] In that same year statement is made "That by the naval store laws, now in force, which comprehend only pitch, tar, and turpentine, such great quantities thereof are produced and imported from our plantations, as enables us to export great quantities thereof to the Streights, Spain, Portugal, Holland and Hamberg.[7]

Governor Johnson of the Carolinas in 1734 writes to the Lords of Board of Trade as follows:[8]

"There is more pitch and tar made in the two Carolinas than in all the other provinces on the continent, and rather more in this than in South Carolina."

The producers were not satisfied to make these products from material on their own land; they early began the practice that obtains to the present day, in some localities, of appropriating the timber of other owners and making whatever products they desired from such acquired property. This condition is complained of as early as 1738.[9]

Unfortunately the records are not complete enough to give data from year to year, of the production or exportation of these products. Export statistics for individual years reveal the fact that the industry was firmly established in North Carolina early in the 18th century and remained there for nearly a century and a half. To this is undoubtedly due the fact that the industry has left its imprint on the state to a greater extent than upon any other state. Tar river is a stream, Tarboro is a city and a "Tar Heel" is a native of North Carolina.

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[1] "Calendar of State Papers—Colonial Series—1661-1668," p. 503.
[2] "Colonial History of the State of New York," v. 4, p. 531.
[3] "Collections of the Mass. Hist. Soc.," v. 3, s. 2, p. 186.
[4] "Colonial History of the State of New York," v. 4, p. 1140.
[5] *Ibid.*, v. 5, p. 117.
[6] "Collection of Hist. Soc. of S. C.," v. 2, p. 238.
[7] Anderson, "Origin of Commerce," v. 2, p. 283.
[8] "The Colonial Records of North Carolina," v. 4, p. 5.
[9] *Ibid.*, p. 285.

BIBLIOGRAPHY OF PHARMACEUTICAL RESEARCH

Conducted by H. V. Arny, Reporter on the Progress of Pharmacy, Chairman of the Committee on Research.

On these pages, each month, will be found a list of articles on pharmaceutical research that appear in the pharmaceutical and other scientific journals of the world. Whenever possible, the list appearing a certain month will record articles appearing in American journals of the preceding month and articles appearing in foreign journals will be recorded as quickly as possible after the journals reach the Reporter.

All articles appearing in these lists will be presented in abstract form in the bound volumes of the YEAR BOOK, which will be issued as soon after the end of the year represented as editing and printing conditions permit. Those desiring abstracts immediately can obtain same for a fee of one dollar each by communicating with H. V. Arny, 115 West 68th St., New York, and arrangements can also be made for securing photographic reproduction of entire articles at moderate prices when such are desired.

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THE NEW FLORAL CLOCK.

S. Leonard Bartin states that since Linnaeus worked out his floral clock the list of available subjects has been very much increased. This is due to the introduction of other kinds of plants and also owing to the fact that new varieties of the old ones frequently show a variation in the time of opening their blooms.

The chief difficulty in putting together the list of subjects for the floral clock has been that they must all flower at the same time of the year, preferably in the summer months of June and July. Also the twelve species selected must expand their blossoms in successive hours from six in the morning to five in the evening. After a large amount of experimenting the following selection of plants has been put together and this is claimed to be the most perfect list for the floral clock up to date. Slight variations in the times of opening might occur in different localities, but it is remarkable how closely the various plants adhere to the times of opening. The times of the expanding of the buds are in all cases put before the name of the plant: 6 A.M., Yellow Hawkweed (*Hieracium aurantiaca*); 7 A.M., Marigold (*Calendula pluvialis*); 8 A.M., Venus' Looking Glass (*Specularia speculum*); 9 A.M., Corn Marigold (*Calendula arvensis*); 10 A.M., Clovewort; 11 A.M., Mountain Dandelion (*Taraxacum montanum*); 12 M., Fig Marigold (*Mesembryanthemum*); 1 P.M., Single Pinks (*Dianthus*); 2 P.M., *Pyrethrum corymbosum;* 3 P.M., Red Hawkweed; 4 P.M., Lady of the Night (*Mirabilis dichotoma*); 5 P.M., Catchfly (*Silene noctiflora*).—*Scientific American.*

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and its branches shall become the property of the Association, with the understanding that they are not to be published in any other publications than those of the Association, except by consent of the Committee on Publication."— By-Laws, Chapter X, Art. III.

Reports of the meetings of the Local Branches should be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten, with wide spaces between the lines. Care should be taken to give proper names correctly, and manuscript should be signed by the reporter. To maintain its activity and representation each Branch should see that at least three of its meetings during the year are reported in the Journal.

BALTIMORE.

The members of the Baltimore Branch of the American Pharmaceutical Association were the guests of the members of the Washington Branch of the American Pharmaceutical Association on January 26, 1921, at the Hotel Willard, Washington, D. C., and preceding that very pleasant and instructive meeting, the Baltimore Branch elected the following officers to serve for the ensuing year:

President, J. C. Krantz, Jr.; *Vice-President*, Carrie G. Mossop; *Secretary-Treasurer*, B. Olive Cole; *Chairman Committee on Membership*, W. Lee Moose; *Chairman Committee on Professional Relations*, H. P. Hynson; *Chairman Committee on Science and Practice of Pharmacy*, H. Engelhardt; *Chairman Committee on Education and Legislation*, E. F. Kelley.

Charles C. Neal, 303 W. Pratt St., Baltimore, Md., was elected a member of the Council of the American Pharmaceutical Association to represent the Branch for the next three years.

B. OLIVE COLE, *Secretary-Treasurer.*

CITY OF WASHINGTON.

The City of Washington Branch of the American Pharmaceutical Association held a joint meeting with the Baltimore Branch on January 26th, this Branch acting as host to the Baltimore members.

Dr. A. R. L. Dohme was invited to be the speaker of the evening and his topic was "Therapeutics."

The paper brought up some very interesting discussions by the various members of the Branches including Dr. F. B. Power, who referred briefly to his work on the Chaulmoogra Oil, and its use in treating leprosy. Dr. Dohme's paper will appear in full in a subsequent issue of the JOURNAL.

At the business meeting preceding the entertainment, the election resulted in all of the previous officers being retained.

H. C. FULLER, *Secretary.*

CHICAGO.

The 115th meeting of the Chicago Branch of the American Pharmaceutical Association was held Friday evening, January 21, 1921, at the College of Pharmacy Building, with a splendid attendance of members and friends. President A. H. Clark presided.

As this was the annual meeting, the annual reports of officers and committees were presented. The Secretary-Treasurer's report was as follows:

The Chicago Branch of the American Pharmaceutical Association, the oldest of the A. Ph. A. Branches, approaches its fifteenth birthday in splendid shape. Not only have we the largest membership in our history and a good financial standing, but we have the best of opportunities to implant in the pharmacists of Chicago those great fundamental principles of professional scientific pharmacy for which the American Pharmaceutical Association has stood these past seventy years.

The membership of the Branch January 1, 1920, was 228 regular members and 82 soldier and sailor members. We have received during 1920, 146 members (130 by joining and 16 by moving in), and have lost from the membership roll 5 by death, 6 by resignation, 9 by suspension and 6 by removal from the Chicago district. Our present membership (348) therefore represents a gain for the year of 122 regular members. Also, we have already received applications from about 30 more persons, but these have not as yet been officially approved for membership. They will serve to start off the new year 1921 in fine shape. From the S & S members we have received 28 regular memberships, 59 have been received from the classes at the School of Pharmacy, 39 from a special drive by mail among Chicago members of the I. Ph. A. and the remainder through personal solicitation by William Gray, Sec-

retary Day, Secretary Gathercoal and others.

Those S & S members who have not transferred to regular membership are automatically dropped at the end of 1920.

The Branch has held eight regular meetings, the 107th to 114th, inclusive, and one special meeting in 1920. The meetings were well attended, the average attendance being 52.

FINANCIAL STATEMENT.

Receipts, 1920.

January balance on hand	$ 53.05
Branch dues in January	71.00
Branch dues in December	64.00
Commission for new members	37.00
Gift from entertainment committee of 1918 meeting	115.29
Total	$340.34

Expenditures, 1920.

Printing and postage	$175.40
Expenses for dinners	36.30
Miscellaneous	6.55
Balance	122.09
Total	$340.34

The report of the Nominating Committee, appointed at a previous meeting, is as follows:

President, C. M. Snow; *First Vice-President*, H. N. Bruun; *Second Vice-President*, Sidney Schmidt; *Third Vice-President*, Mrs. A. T. Carpenter, of Valparaiso; *Secretary-Treasurer*, E. N. Gathercoal; *Council Member*, C. M. Snow.

The report was adopted and the nominees were declared elected to their respective offices.

Dr. Bernard Fantus and Prof. C. M. Snow presented the paper of the evening, entitled "U. S. P. and N. F. Elixirs." The paper was accompanied by a very extensive and interesting display of elixirs that they had compounded and presented some very surprising, but very valuable results. While it is very difficult to summarize so complete a paper, it may be stated that the first suggestion was the preparation of two elixirs, "Aqueous Elixir," containing but 5 percent of alcohol, and "Alcoholic Elixir," containing 98 percent of alcohol. By mixing these two elixirs in various proportions "iso-alcoholic elixirs" of suitable strength can be prepared as a vehicle for galenicals of any alcoholic strength. A complete review of the N. F. elixirs was presented in which their faults were criticized and suggestions made for improving them. No attempt was made to meet the question of the beverage use of these elixirs, it being accepted that it were better to allow them to remain under the class of beverage alcoholic preparations and retain their suitability as vehicles, rather than remove the alcohol from them and render them less suitable as vehicles.

The paper was extensively commented upon by Wm. Gray, H. C. Christensen, I. A. Becker, W. B. Day, A. H. Clark, James Berardi, Stanley Clark and others.

Professor Snow pointed out that the present U. S. P. Elixir Glycyrrhizae kept well, showing samples in partially filled bottles that had been made as far back as June 1918, all of which were in perfect condition.

E. N. GATHERCOAL, *Secretary.*

NEBRASKA.

The January meeting of the Nebraska Branch of the American Pharmaceutical Association was held in the library of the College of Pharmacy of the University of Nebraska on the evening of January 10. In the absence of the President, the meeting was called to order by Secretary Niels Mikkelsen, president of the Nebraska State Board of Pharmacy, who presented amendments to the state pharmacy law. According to these amendments all candidates who present themselves before the State Board after 1922 must be graduates from reputable colleges of pharmacy, the board to define reputable colleges. The board also is to have the power to make any rulings which may advance the science and the art of pharmacy in the state. This and other amendments to the pharmacy law will be submitted before the state legislature now in session and it is confidently expected that they will become a law without opposition.

Dr. Rufus A. Lyman made a plea for the modernization of the college of pharmacy curricula, especially in physiological and pharmacological instruction. Physiology and pharmacology cannot be taught satisfactorily by the lecture and text-book methods. Suitable laboratories must be provided and the work of the student directed by competent laboratory assistants.

The dues of the Branch were fixed at one dollar per year, and it was voted that suitable Branch association stationery should be used. C. P. Hildrebrand, the new state board member, was the guest of the evening. Among those who took part in the discussions were Guy Butler, A. Schneider, C. P. Hildrebrand, Miss Easton, Miss Malick, and others.

ALBERT SCHNEIDER, *Secretary.*

NEW YORK.

The January 1921 meeting of the New York Branch of the American Pharmaceutical Association was called to order in the lecture hall of the New York College of Pharmacy Building, Monday, January 10th, at 8.15 P.M.

Sixty-seven members and friends were present.

The minutes of the preceding meeting were read and approved.

Treasurer's Report.—The Treasurer's report was received and ordered filed.

Membership Committee.—The following applications have been received for membership:

PARENT ORGANIZATION.

Frank H. Eckert, 461 Clinton Ave., West Hoboken, N. J.

Harry E. Alvord, Chatham, N. Y.

Paul D. Bloom, 4815 Third Ave., Brooklyn, N. Y.

Albert J. Dougherty, 1071 Bedford Ave., Brooklyn, N. Y.

Chas. F. O'Hagan, 30 N. Main St., Portchester, N. Y.

Isidor Lipowsky, 79 Purchase St., Rye, N. Y.

Wm. I. Smith, 855 Tremont Ave., N. Y. City.

LOCAL BRANCH.

Elmer H. Hessler, 88 Reade St., N. Y. City.

Tom Potts, 640 Broadway, N. Y. City.

Education and Legislation.—Chairman Eddy brought in no report.

Member of the Council.—Dr. Hostmann reported that the result of the balloting on the date for the 1921 Convention showed a majority in favor of holding the meeting the first week in September.

New Business.—Dr. R. P. Fischelis read a clipping from a journal in which he called attention to the progress made by pharmacy in the Medical Corps of Belgium, and to the International Congress of Medicine and Pharmacy, to which all the physicians and pharmacists of the allied and neutral countries were invited. It was moved, seconded and carried that the matter be brought to the attention of the chairman of the Council with the request that some action be taken.

Dr. W. C. Anderson now announced that if there were no objections he would introduce Dr. Lentz at the conclusion of the scientific program, in order to allow the regular speakers of the evening to have preference. No objection was voiced to this procedure.

The Nominating Committee brought in the following report:

President, Wm. C. Anderson; *Vice-President*, Curt P. Wimmer; *Secretary*, Hugo H. Schaefer; *Treasurer*, Gustave Horstman; *Chairman Program of Pharmacy*, Geo. C. Diekman; *Fraternal Relations*, Henry B. Smith; *Education and Legislation*, Clyde L. Eddy; *Membership*, Robert R. Gerstner; *Audit*, Jacob Diner.

It was regularly moved, seconded and carried that the Chairman of the Nominating Committee shall cast one ballot unanimously electing the candidates as mentioned in the report.

SCIENTIFIC SECTION.

Dr. Diekman, chairman of the Committee on Progress of Pharmacy, brought in a lengthy and interesting report consisting of abstracts of various current scientific articles.

Mr. Geo. M. Beringer was now introduced by Chairman Anderson and presented a paper on American Pharmaceutical Research. At the conclusion of this paper discussion was opened by Dr. H. V. Arny; Dr. Mayer, Dr. Wimmer, Mr. Eddy and Dr. Diner also took part in this discussion. This was followed by a rising vote of thanks extended to the speakers.

Chairman Anderson now introduced Dr. Lentz, who outlined the work of the Kings County Professional Guild, relative to legislation affecting pharmacy and medicine. It was moved, seconded and carried that a committee of five be appointed to confer with similar committees of other associations with reference to enlarging the work of the Guild.

Chairman Anderson appointed Messrs. Lehman, Eddy, Mayer, Lascoff and Bigelow to act on this committee.

Thomas Potts, formerly of Chicago, was now introduced and briefly addressed the meeting.

HUGO H. SCHAEFER, *Secretary.*

PHILADELPHIA.

DECEMBER MEETING A NOVEL ONE.

On December 14th, at the usual evening hour at which this Branch convenes at the Philadelphia College of Pharmacy and Science, the shades of five alchemistic celebrities responded to the summons of the Egyptian deity, Hermes Trismegistus, and performed for a present-day audience some of the tricks of the black art with which they had mystified—yes, and terrorized—their contemporaries in that distant past when the forces of nature were but little understood. Just as astrology preceded astronomy, and legendary loer preceded history, so alchemy preceded chemistry.

It is out of alchemy that chemistry developed, and upon which it is built. These men—alchemists—who searched for the philosopher's stone, and for the elixir of life, and searched in vain, did in fact make many important advances in that domain of knowledge out of which our modern science of chemistry has risen. History deals rather rudely with the alchemist, and in fiction he is the object of ridicule or of scorn—witness, Dousterswivel in Sir Walter Scott's "Antiquary." But inasmuch as the search for the philosopher's stone and for the elixir of life led to numerous discoveries which were not altogether devoid of practical value, it is quite proper that we should have our attention directed from time to time to the greatest of these ancient votaries of research along lines which we now classify as chemical.

To be sure, at this evening entertainment there were some anachronisms, as, for example, when Geber, who should have spoken fluently in classic Arabic of the vintage of 750 A.D., or thereabouts, rolled off in Welsh the way stations of a narrow gauge railroad in Wales, and when Paracelsus who should have communicated his thoughts to us in sonorous Latin, or Hochdeutch, of the 17th century, spoke in a dialect which was suspiciously like the Pennsylvania Dutch of "Sous Beslehem," Pa. We were mildly surprised also to see Roger Bacon, whose earthly labors ended about nine hundred years ago, use phenolphthalein and other products of modern synthesis with skill which indicated intimate familiarity with these substances. But what would one have? When we attend a dramatic performance of Richelieu, do we object if the Cardinal's robe is of modern weave and dyed with a synthetic dye which traces its ancestry to the tar barrel? Aren't we satisfied if the atmosphere is correct and an air of verisimilitude pervades? And judged along these broad lines the performance was splendid, and highly enjoyable, not only for chemists, but also for those who had no understanding of the reactions involved. Indeed, those who were mystified the most, enjoyed it best.

When we entered the chemistry lecture room, we were in semi-darkness, and fumes and strange odors pervaded the air. The present-day workaday world, with its noises and its bright lights, had been left behind. We were in a strange world—and in strange company. Robed figures moved stealthily back and forth behind the lecture table and worked with strange paraphernalia, the purport of which we did not as yet apprehend; then rose Hermes Trismegistus to address the assembly. The rays of a feeble flame illuminated his countenance, and we saw that his profile was aquiline, his hair and eyes black, and his complexion swarthy, as befitted a deity of old Egypt. He said:

"I speak not of fictitious things but what is true and most certain. What is below is like that which is above, and what is above like that which is below, to accomplish the miracles of one thing.

"And as all things were produced by the mediation of one being, so all things were produced from the one thing by adaptation.

"Its father is the sun, its mother the moon, the wind carries it, its nurse is the earth.

"It is the cause of perfection throughout the whole world.

"Its power is perfect if it be changed into earth.

"Separate the earth from the fire, the subtle from the gross, acting prudently and with judgment.

"This thing is the fortitude of all fortitude, because it overcomes all subtle things and penetrates every solid thing.

"Thus were all things created.

"Whence proceed wonderful adaptations which are produced in this way.

"Therefore am I called Hermes Trismegistus, possessing three parts of the philosophy of the whole world."

* * * * * *

"My confreres are the shades of those who attained to eminent distinction in the ages past in works of alchemy and magic:

"Paracelsus—Philippus Aureolus Theophrastus Bombastus von Hohenheim, whose erratic genius in the 16th century revolutionized alchemy, and founded the school of Iatrochemistry, which had for its object the preparation of medicines instead of the foolish quest of the philosopher's stone.

"Albertus Magnus, or Albert Groot, or Albert von Bollstadt, a German alchemist of the 13th century who after his education at Padua entered the Dominican order, and devoted his life to science.

"Roger Bacon—the most illustrious of medieval alchemists, an Englishman, and of the Franciscan order. He was a firm believer in the philosopher's stone. By some he is credited with the discovery of gunpowder.

"Geber—An Arabian alchemist of the 9th century. He was the first to describe many chemical operations, such as distillation,

sublimation, calcination. But his voluminous writings contained so much which was mystical and obscure, that Samuel Johnson was led to believe that the word gibberish had been derived from the name of this famous alchemist.

"Joseph Balsamo, better known in history as Cagliostro, an Italian of the 18th century, a man of mystery, of magic, and an expounder of the occult.

"These spirits have appeared to remind you of their almost forgotten existence, and to demonstrate that instruction and entertainment have a common meeting ground."

* * * * * *

The shades assembled then proceeded to do things. They waved their wands, and colors appeared on white surfaces. Liquids blushed and paled, turned blue or purple, as with cold. Flames of fire were projected toward the audience; strange odors developed; explosions happened, seemingly without cause. Events followed in rapid succession. Nor did the shades condescend to lift the veil of mystery, or indeed to turn on the bright light provided by the genius of the great modern wizard, Edison, until the programme had been brought to a close.

When the shades had divested themselves of their somber gowns and makeup, it was disclosed that Hermes Trismegistus was none other than Prof. C. H. LaWall, Paracelsus stood forth as Prof. F. P. Stroup, Geber was Ivor Griffith, instructor in pharmacy, Albertus Magnus, Ralph R. Foran, instructor in Technical Chemistry, Roger Bacon, Edward J. Hughes, instructor in Chemistry, and Joseph Balsamo, Joseph W. E. Harrisson, of the class of 1916, and now serving as the secretary of the Philadelphia Branch.

It was to these men that the audience extended a hearty vote of thanks for a most enjoyable evening. J. W. STURMER.

JANUARY MEETING.

The regular monthly meeting of the Philadelphia Branch of the American Pharmaceutical Association was held at the Philadelphia College of Pharmacy and Science, Tuesday evening, January 11, 1921, President Goodhart presiding.

The minutes of the previous meeting having been read and approved and new members elected, a report of the result of the vote sheets sent out on deletions and additions to the National Formulary, was received. Numerous communications expressing a variety of views on the National Formulary were received. After a discussion of the matter Prof. Charles LaWall moved that all communications and data received should be forwarded to Chairman W. L. Scoville of the National Formulary Revision Committee.

Dr. Ivor Griffith then opened the scientific features of the evening with a paper entitled, "Seriological Tests as Diagnostic Aids." By interspersing with his Welsh wit he presented the subject in such a manner that it was of interest to all, and also very clearly showed the advantages derived from such tests.

"A More Practical Assay Process for Some Zinc Salts of the U. S. P.," by George Éwe and Fred. Gloor was then presented by Mr. Éwe. Mr. Éwe pointed out the fallacy of determining the purity of zinc salts by the estimation of their acid radical. He advocated the estimation of the zinc by titration with a standard solution of potassium ferrocyanide, results being much quicker and the method more easily handled than the present U. S. P. method.

Prof. LaWall discussed the paper, after which both contributors of the evening were given a vote of thanks.

At the December meeting of the Branch the resignation of Secretary Elmer H. Hessler was received, due to his leaving the city. Mr. Hessler was commended for the very efficient and hearty services he had rendered the Branch. J. W. E. Harrisson was then nominated and elected to fill the unexpired term of Mr. Hessler. J. W. E. HARRISSON, *Secretary.*

COUNCIL BUSINESS

A. PH. A. COUNCIL LETTER NO. 12.

(Abstract.)

WASHINGTON, D. C., January 18, 1921.

53. *Representation on Advisory Council of the National Botanic Garden (Items 45 to 49).* *Result of vote.* Motion No. 49, a motion authorizing the Council of the American Pharmaceutical Association to inform Mr. J. G. Langdon of the Fine Arts Commission at Washington that the American Pharmaceutical Association would be pleased to be represented

on the Board of Control or Advisory Council of the National Botanic Gardens, has received a majority of affirmative votes.

Mr. Langdon on being informed by your Secretary of this action replied under date of January 7, 1921, as follows:

"I am glad to get your letter showing the disposition of your association in the matter of Botanic Garden coöperation. The method of handling the work of the Botanic Garden by the aid of an Advisory Council has met with opposition among those backing the movement. I am of the opinion, therefore, that the time is not yet ripe to push this end of it very vigorously but that it will be better to wait until the Congress acts in the matter of securing the land before we stir it up again. Some of those interested have an idea that it would be best to hire a young and alert botanist and give him full reign to do as he pleases in developing the garden. There are others of us, and we are still in the majority, who think that if allied interests are to be best served in a national garden some sort of representation by those interests must be had.

"I would, therefore, think that it is best for you to delay formal action in the matter until after the exact means of control has been determined upon.

"I hope to inform you later on as to what disposition Congress has taken in the matter."

54. *Budget of appropriations for 1921—Result of vote.* Motion No. 51, a motion to approve the budget for 1921 as prepared by the Finance Committee, has received a majority of affirmative votes.

55. *Election of active members—Result of vote.* Motion No. 52 (Applications Nos. 290 to 340, inclusive, for active membership) has received a majority of affirmative votes.

56. *Report on the finances of the Journal.* On recommendation of Secretary Day and Caswell A. Mayo, the following excerpt from a letter written by Editor Eberle to Prof. Day under date of January 4, 1921, and corrected in a subsequent letter written the 5th instant, is given for the information of members of the Council:

"Last year the receipts of the JOURNAL amounted to $6,114.69, divided as follows: Advertising, $5,229.50; Journal subscriptions, $360.70; Reprints (small amount from type cuts), $524.49. The total expenses, not including the Editor's salary, of last year, amounted to $7,635.80. The advertising earned and not paid at the end of 1919 amounted to $573.90.

The receipts for this year amount to $9,003.95, divided as follows: Advertising, $7,742.62; Journal subscriptions, $547.36; Reprints (small amount from type cuts), $713.97. The total expenses, not including the Editor's salary, for this year, amounted to $10,298.72.

The number of reading pages at end of 1919 was 1124, index pages 16; end of 1920, 1216, index pages 20. Number of Journals printed in 1919, 38,200; in 1920, 42,500; increase in 1920, 4,100.

The receipts from advertising increased $2,513.12; subscriptions, $186.66; Reprints, etc., $189.48; total increase, $2,889.26; increase in expenses, $2,662.92.

Making deduction from increased receipts, it will be seen that the net Journal expenses for 1920 were $226.34 less than in 1919, not taking into consideration that we have a larger uncollected amount due, printed 4,100 more copies in 1920, and also 100 more reading pages."

57. *Election of active members.* You are requested to vote on the following applications for active membership:

No. 341, Wesley John Robinson, 1816 Eighth St., Peru, Ill.; No. 342, Ralph M. Stevenson, 100 John St., New York, N. Y.; No. 343, Morris Grossman, 130 N. Center St., Orange, N. J., S. and S. membership; No. 344, George Horn, 711 W. 69th St., Chicago, Ill. No. 345, Jo Stotlar, 2327 Jackson Blvd., Chicago, Ill.; No. 346, Barney Kite, 2559 W. North Ave., Chicago, Ill.; No. 347, Martial B. Casteix, 339 Bourbon St., New Orleans, La.; No. 348, Benjamin J. Glick, 3756 N. Ashland Ave., Chicago, Ill.; No. 349, Stanislav M. Kolar, 3644 South Seeley Ave., Chicago, Ill., S. and S. membership; No. 350, Mark Eldon Neville, Cor. Washington and Genesee, Waukegan, Ill., S. and S. membership; No. 351, Edwin Walter Crysler, 3498 S. Broadway, Englewood, Colo.; No. 352, Geo. S. Borovik, 4805 Armitage Ave., Chicago, Ill.; No. 353, Joseph Janda, 2809 S. Hamlin Ave., Chicago, Ill.; No. 354, Benjamin Friedlander, 1647 S. Clifton Pk. Ave., Chicago, Ill., S. and S. membership; No. 355, Morris Ginsburg, 2630 Iowa St., Chicago, Ill.; No. 356, Arthur E. Breslin, 724 S. Jeff Davis Parkway, New Orleans, La.; No. 357, Athol L. Waggoner, 4026 W. Adams St., Chicago, Ill., S. and S. membership; No. 358, Alexander Schmeier, 500 W. 176th St., New York, N. Y.; No. 359, Augusta Litvin, 2438 Second Ave., New York, N. Y.; No. 360, Alexander Doctors, 133 Strong St., Corona, Long Island, N. Y., No. 361, Dan Mitchell, P. O. Box 913, Mobile, Ala.

A. G. DUMEZ, *Secretary.*

COMMITTEE REPORTS

REPORT OF THE COMMITTEE ON EXAMINATION QUESTIONS.*

The Committee has confined the work of this year largely to the consideration of questions. It has not been the object to present a large number, but to choose some which will illustrate some of the good points and some of the poor points and thereby suggest some things which we all may not have considered. The Committee has also tried to formulate some general statements which should govern every examiner in framing questions.

Questions which are asked by teachers are based on the instruction given, and in developing greater uniformity of the instruction there will be a greater uniformity of questions, and it was along this line that the Committee worked last year. In selecting the questions which follow it has been the desire of the Committee to consider questions which would be suitable for teachers and for boards.

In framing questions, the examiner on the Board of Pharmacy must always keep in mind the fact that applicants for registration have received their knowledge in different ways and from different sources; that the questions asked must be those which the applicant ought to know to be prepared to practice pharmacy. Occasionally we are forced to believe that the examiner has not given the attention and thought which he ought to have given in preparing them. He has forgotten the difference it makes to the applicant whether he passes or not; he has forgotten the importance of safeguarding the public in allowing an unprepared man to pass. I have known the same set of questions to be asked several times at short intervals.

GENERAL STATEMENTS.

1. Questions should not be ambiguous, but should be so clearly and distinctly worded that they cannot be misunderstood.

2. Questions should be of such a nature that they cannot be answered by "Yes" or "No," unless perhaps in an oral quiz.

3. Questions should be of such a nature that the examinee cannot ramble on without giving a definite answer. Commencing the questions with "Discuss" or "Tell all you know" is likely to bring out an indefinite answer. In answering such a question the applicant may feel certain that he has done credit to himself when in fact he may have missed the point entirely.

4. Quite a number of questions should be so worded that they will not involve memory effort alone; so worded that the person answering them must use some reasoning. The candidate usually survives better from reasoning, if such he can, than from "constantly trying to think" a memory answer, and the answer is rarely the result of pure guess work. Such questions may well begin with "Why."

5. Questions should be so worded that the answer shows a wider knowledge of the subject than the question on the face of it would indicate. For example, in answering the question "Why does Fowler's solution give a precipitate with solution of most alkaloidal salts?" the applicant must know what Fowler's solution is, its composition, its reaction to litmus, that the acid of the salt has a stronger affinity for the alkali than for the alkaloid, and that free alkaloids are sparingly soluble in water.

6. Some questions should deal as much as possible with broad generalities rather than with special phases of the subject.

7. Some credit should be allowed in grading an answer where it is partly right and partly wrong, *e. g.*, in a problem when the method is right and the answer wrong. The danger is that we are often inclined to give too much credit.

8. Questions involving mathematics should have all the data as to atomic weight, specific gravity, etc., included.

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* Presented at joint session of Section on Education and Legislation, A. Ph. A., American Conference of Pharmaceutical Faculties, and National Association of Boards of Pharmacy, City of Washington meeting, 1920.

9. Catch questions should be avoided. However, a few persons contend that catch questions are a test of acuteness of mind and the pharmacist must have this acuteness in cases of emergency and therefore to a certain extent such questions are admissible.

The following statements apply more particularly to board examinations.

10. Questions prepared by different members of a board should be reviewed by one man for the purpose of eliminating duplicates and preventing one examiner from trespassing on another's subject. There should be no duplication, and no questions asked which are partially answered in other questions.

11. In states where there is no prerequisite law, it is entirely proper for the board to ask questions which the man who has not had a college training may not be expected to know, provided the question is one which every trained pharmacist should know.

12. Questions should cover a wide scope and not be along only a few lines.

13. Questions should avoid disputed or doubtful ground.

14. Questions on microscopical appearance of drugs should not be asked at the present stage of pharmaceutical education.

15. That questions on therapeutics should not be asked seems to be the opinion of the majority of the Committee who have discussed this point. Certainly the pharmacist should not use his knowledge of therapeutics for counter-prescribing. But a good knowledge of the general action and uses of drugs will make a better pharmacist. He can talk more intelligently with physicians, he will have a better appreciation and understanding of pharmacy, will be in better position to treat an emergency case of poisoning, and will enjoy his work more.

16. Questions on doses should be asked, whether average or maximum doses are called for. The pharmacist must be able to check the doses as given by the physician. It is a rather hotly disputed question whether average doses or usual maximum doses be taught and asked for. Those favoring the average dose claim that authority is established for such doses and that it is a safe rule to view with suspicion a dose that is more than twice that of the average dose. Those favoring the usual maximum dose claim that this dose is the one which should be remembered because it is the one beyond which it is not advisable for the dispenser to go without further knowledge. This Committee is not agreed.

17. Questions of bacteriology, disinfection, and biologic products should be asked.

18. Questions on commercial pharmacy should not be asked. Here, too, is some disagreement in the Committee. Some claim that a certificate of registration in a measure certifies to the man's qualification as a clerk, that a knowledge of advertising, book-keeping, salesmanship, etc., is as important as a knowledge of many of the processes of pharmaceutical manufacture. Other persons claim that the pharmacy laws are passed for the protection of the people and under these laws the boards are appointed to determine the competency of applicants to handle and dispense drugs, to test the purely professional knowledge of the applicant, and not his commercial knowledge.

19. A selection of a certain number of questions out of the set given (say ten out of twelve or fifteen) should not as a rule be allowed the applicant.

20. The larger the number of questions asked, the fairer is the examination. It is better to ask a large number of questions having comparatively short answers, than to ask a smaller number with long answers.

21. Questions on pharmaceutical arithmetic should be given in a separate set, because if distributed through the subjects of chemistry, pharmacy, or materia medica, the applicant may get a passing grade without knowing anything about problems. The solution of problems should not be dependent upon a knowledge of chemistry, pharmacy, or materia medica.

QUESTIONS WITH COMMENTS.

PHARMACY.

1. (*a*) Why is an excess of lime kept in the lime-water container? (*b*) Why is glycerin used in the first part of the menstruum only in making fluid extracts by "type process B"? (*c*) Why is potassium iodide used in making Lugol's solution? (*d*) Why is hypophosphorous acid used in making syrup of ferrous iodide?

Comment. This type of question is particularly good. Before the student can give a reason he must know considerable about the preparation.

2. (*a*) How much ethyl nitrite is there in spirit of nitrous ether? (*b*) What ingredients in the formula react to make ethyl nitrite? (*c*) Why is sodium carbonate used? (*d*) Why is potassium carbonate used? (*e*) Why does this preparation frequently effervesce with ammonium carbonate?

Comment. On the whole the question is a good one, but (*b*) might be worded better by asking for the chemical reactions which take place in making ethyl nitrite.

3. Tell all you know about adeps lanae and compare it with adeps lanae hydrosus.

Comment. To ask a person to tell all he knows on a subject is too indefinite and unsatisfactory and in place of the second part it would be better to ask for the essential differences between adeps lanae and adeps lanae hydrosus.

4. (*a*) Name the official substances obtained from petroleum. (*b*) What advantage has petrolatum over lard and other fats?

Comment. A part of the answer for (*a*) is given in (*b*). Such cases should be avoided.

5. Give the formula for Basham's mixture.

Comment. For common preparations it is well to ask for the ingredients, though not the amounts except it be for a very active agent. Possibly in a question like this too much stress is laid on the synonym for it cannot be answered unless the synonym is known.

6. (*a*) Give the process for making syrup of ferrous iodide. (*b*) Give the equation to show the reaction.

Comment. The general method of making such common preparations should be known, but not necessarily the details. Knowing the process will help to keep the reaction in mind and knowing the reaction will aid in remembering the process.

7. (*a*) What are mucilages? (*b*) Name those official.

Comment. Applicants should be able to define the different classes, but it is not necessary for them to remember which are official. Right here comes up the question as to what things are official. Does the examiner refer to U. S. P. articles or does he include the N. F.? Both are official under the Food and Drugs Law.

8. What is the official Latin name of (*a*) Hoffman's anodyne, (*b*) carron oil, (*c*) Goulard's extract, (*d*) Fowler's solution.

Comment. The pharmacist should know thoroughly all synonyms which he is likely to meet. The fact that he can place a preparation when it is called for under one of its synonyms increases the confidence of the patient or physician.

9. Give a type process for making a fluidextract.

Comment. It would be better to ask for the explanation of a type process.

10. Criticise the following prescription:

℞

Corrosive sublimate	gr. ij
Potassium iodide	dr. vj
Tinct. chloride of iron	oz. ss
Tinct. nux vomica	dr. ij
Tinct. cinchona comp., q. s. ad	oz. iv

MS. Teaspoonful in water after meals.

Comment. When a criticism is asked for a student does not know how much to write. It would be better to put the question as follows: (*a*) Give all possible reactions and incompatibilities. (*b*) Give in detail the method and order of filling, or if you would not fill, give your reason. (*c*) Give the appearance of the finished prescription.

PHARMACEUTICAL ARITHMETIC.

1. (*a*) Convert the following into the metric system:

℞

Quininae Sulph	gr. xxiv
Acidi Sulph. arom	dr. ij
Syr. Aurantii	oz. ss
Aquae q. s. ad	oz. iv

(*b*) ℞

Quininae Sulph	4.0
Ferri phos. Sol	3.1
Strychninae Sulph	0.065
Arseni Triox	0.1
Elixiris arom., q. s. ad	250.0

2. (*a*) Boric acid is soluble in 18 parts of water: What is the percentage strength of a saturated solution? (*b*) How much 4% cocaine hydrochloride solution can be made from a 1/8 oz. vial of cocaine hydrochloride?

3. Four fluidounces of a stock solution contain 120 grains of mercuric chloride. How many minims of this stock solution should be used in making one gallon of a solution 1:1000?

4. Compound spirit of ether contains:

325 Cc. Ether, sp. gr. 0.715
650 Cc. Alcohol, sp. gr. 0.809
25 Cc. Ethereal oil, sp. gr. 0.905

What is the specific gravity of compound spirit of ether?

5. How many grammes of 68% nitric acid are required to convert 28 Gm. metallic mercury into mercuric nitrate?

$(3Hg + 8HNO_3 = 3Hg(NO_3)_2 + 2NO + 4H_2O$ Hg = 198.5.
H = 1 N = 14 O = 16.

6. A syrupy extract of nux vomica contains 45% moisture and 11% alkaloids; how much starch must be added to 1 lb. of the syrupy extract after it has been dried to make an extract containing 16% alkaloids?

CHEMISTRY.

1. Define chemistry, acids, bases, salts, basic salts, atom, molecule.

Comment. These definitions might well be omitted. They are so frequently asked that every one cramming for examination will memorize them, although he may have practically no knowledge of chemistry.

2. Hydrogen Dioxide. (*a*) Give the graphic formula. (*b*) Give the manufacture of the official solution. (*c*) With what is the commercial solution frequently preserved? (*d*) How is the strength determined?

Comment. Graphic formulas should not be asked for on board examinations. (*b*) and (*d*) should be replaced by questions which come more into the pharmacist's regular work.

3. Iodine. (*a*) What reactions take place in making the so-called colorless tincture of iodine? (*b*) What is formed when ammonia water is added to iodine? (*c*) What is the most delicate test for the detection of iodine in such a liquid as syrup of ferrous iodide?

Comment. (*a*) and (*b*) should not be asked in the same set of questions as (*b*) is included in (*a*). In (*c*) the examiner probably wanted the starch paste test but shaking with chloroform is also very delicate. In wording the question it would be better to replace the words "the most" by "a."

4. What reactions take place in making (*a*) Syrup ferrous iodide; (*b*) Spirit of Mindererus; (*c*) Labarraque's solution; (*d*) Compound cresol solution?

Comment. This is a good question, the application of chemistry to practical pharmacy.

5. Give the solubility in water and in alcohol of (*a*) Potassium iodide; (*b*) Mercuric chloride; (*c*) Potassium acetate; (*d*) Quinine sulphate; (*e*) Boric acid.

Comment. Pharmacists should know the approximate solubility of common salts, but not necessarily the exact figure.

6. How are the following assayed: (*a*) Ammonia; (*b*) Tincture of iodine; (*c*) Laudanum?

Comment. While the applicant should understand the principles embraced in assay processes and perhaps should know in general the method, he will rarely do the work, and there are so many other questions bearing more directly on the actual store work that it is not advisable for boards to ask for these methods. The answering correctly of such a question indicates that the applicant has had a good chemical training.

7. By what means can you tell the difference between: (*a*) Oxalic acid and Epsom salt; (*b*) Morphine sulphate and quinine sulphate; (*c*) Benzoic acid and salicylic acid?

Comment. The question is indefinite and should be changed to call for the differences in physical properties or in chemical tests.

8. Give tests for the identification of (*a*) Potassium iodide; (*b*) Calcium phosphate.

Comment. The advisability of asking such a question on a board examination seems to be disputed, some saying it is not fair, others saying that the applicant should know enough of chemistry to know the tests for the common simple salts.

9. (*a*) What is formaldehyde? (*b*) What is salol? (*c*) What is formed when an acid acts on a base?

Comment. Would "Formaldehyde is a liquid used as a germicide," "Salol is a white powder with a peculiar odor, that is prescribed by doctors as an intestinal antiseptic." "Water is formed when an acid acts on a base," be acceptable answers or answers which are deserving of any credit? Examiners generally say no.

10. (*a*) Why is a solution of mercuric chloride poured into lime water and not lime water into mercuric chloride solution in making yellow lotion? (*b*) Why is a solution of ferric sulphate poured into ammonia and not ammonia into ferric sulphate in making ferric hydroxide? (*c*) Why are ammonium carbonate and ammonia water allowed to stand together for twelve hours in making aromatic spirit of ammonia?

Comment. This is a good type of questions.

BOTANY.

1. Define the following terms: (*a*) Botany; (*b*) Phyllotaxy; (*c*) Phanerogams; (*d*) Cryptogams.

2. (*a*) How does a rhizome differ from a tuber? (*b*) How does a saprophytic differ from a parasitic root?

3. (*a*) What are stomata and what is their function? (*b*) How do glandular and non-glandular trichomes differ in appearance and function?

4. (*a*) What is a glabrous leaf? (*b*) A coriaceous leaf? (*c*) A punctate leaf? (*d*) What tissues enter into the structure of a leaf?

5. What is meant by (*a*) Sessile flower? (*b*) Deciduous tree? (*c*) Corm? (*d*) Dehiscent fruit?

Comment. In order to read descriptions of drugs intelligently, a knowledge of terms used is essential and boards should give the subject of botany more attention.

PHARMACOGNOSY.

1. Belladonna root. (*a*) Give natural order. (*b*) Give U. S. P. definition. (*c*) Describe the plant yielding it. (*d*) Write the macroscopical and microscopical description of it. (*e*) Name the active principles. (*f*) Give the habitat. (*g*) Name the adulterants.

Comment. (*a*) Natural orders should not be asked for on board examinations and it is a disputed question whether students in colleges should be required to get many of them. (*c*) The description of belladonna plant should not be required, as it is grown in only a few localities in the U. S. (*d*) Certainly the microscopic description should not be required and only macroscopical description of a few of the most common drugs. (*g*) The adulterants of a drug are continually changing and this information is of but little value to the retailer. The U. S. P. definition, the active principles and the general habitat should be known.

2. Give the Latin official names of (*a*) May apple; (*b*) Monk's hood; (*c*) Henbane; (*d*) Black haw; (*e*) Pink root.

Comment. Synonyms should be known.

3. Name the plants from which the following are obtained: (*a*) Emodin; (*b*) Punicine; (*c*) Eserine; (*d*) Sparteine; (*e*) Atropine.

Comment. A good question. Either the Latin or common name should be acceptable.

4. Name the important poisonous and medicinal plants of your state.

Comment. This is a test of the general information of the applicant.

THERAPEUTICS.

1. Define (*a*) Materia medica; (*b*) Mydriatic; (*c*) Idiosyncrasy; (*d*) Synergist; (*e*) Diaphoretic; (*f*) Soporific.

Comment. The definition of the classes of medicines should be known. The examiner must keep in mind the fact that materia is used in the broad sense to include all we know about medicines and in the limited sense as being synonymous with pharmacognosy.

2. Give the classes to which the following belong, from a therapeutic standpoint: (*a*) Santonin; (*b*) Pilocarpine; (*c*) Sodium phosphate; (*d*) Strophanthin; (*e*) Hydrastis.

Comment. Pharmacists should know the principal classes at least.

3. Give the therapeutic action and uses of: (*a*) Chloral hydrate; (*b*) Arsenic trioxide; (*c*) Digitalis.

Comment. See General Statement No. 15.

4. Name (*a*) Three vegetable cathartics; (*b*) Four diuretics; (*c*) Four antiseptics; (*d*) Drugs obtained from *Sus scrofa*.

5. Which of the following are hypnotics, which anthelmintics, which irritants: (*a*) Aspidium; (*b*) Mustard; (*c*) Iodine; (*d*) Santonin; (*e*) Potassium bromide; (*f*) Sulphonal?

Comment. Both questions 4 and 5 are good.

POSOLOGY AND TOXICOLOGY.

1. Define (*a*) Toxicology; (*b*) Lethal; (*c*) Poison.

Comment. The examiner is bound to accept almost any definition of a poison even when it is a long way from an accurate one. It would be better to leave it out.

2. Give the dose of (*a*) Confection of senna; (*b*) Pancreatin; (*c*) Potassium acetate; (*d*) Fluidextract of dandelion.

Comment. No valuable information regarding the applicant's knowledge is brought out. It is better to ask the doses of potent agents.

3. Give the average dose of (*a*) Atropine sulphate; (*b*) Strychnine sulphate; (*c*) Phenol; (*d*) Cocaine hydrochloride; (*e*) Aconitine.

Comment. See General Statement No. 15.

4. Name a physiological antidote for (*a*) Belladonna; (*b*) Aconite; (*c*) Physostigmine.

Comment. While pharmacists should be well posted on antidotes, not many would be able to name physiologic antidotes.

5. Give the treatment of poisoning by (*a*) Strychnine; (*b*) Phenol; (*c*) Morphine.

Comment. The treatment should be given "in full." There is always some excitement in a case of poisoning and the pharmacist should know so thoroughly what to do that he will not lose his head and will make use of what may be at hand. The mentioning of one antidote should not be sufficient on an examination.

PHARMACOLOGY.

BIOLOGIC ASSAYING.

1. Explain the difference between assaying and standardization. Define physiological standardization.

2. Can standardized tinctures or fluidextracts be made from standardized drugs? Give reasons for your answer.

3. Why is it necessary to physiologically standardize some drugs and not others? How are most drugs and chemicals standardized?

4. Give three principal *type* methods available for biologic standardization.

5. Describe the action of the digitalis group upon the frog's heart; upon the blood pressure.

Comment. Questions on biologic assaying are more advanced than most applicants for registration can stand, but we will probably come to them.

BACTERIOLOGY AND IMMUNOLOGY.

1. Sterilization: Name and describe each way in which it may be accomplished.

Comment. This would read better "Sterilization: Name and describe several ways in which it may be accomplished."

2. Describe in full how a room may be disinfected by formaldehyde; by sulphur.

3. Describe in full how agar culture medium is made (substances used, neutralization, filtering, tubing, and sterilizing).

4. What rôle do insects play in the transmission of disease? Name two diseases transmitted by mosquitoes.

5. What is an antigen? an antibody? Distinguish between antitoxic, lytic, and phagocytic immunity.

6. Diphtheria antitoxin: How is it prepared? What is the standard antitoxin unit? What is the U. S. P. dose? Can this safely be exceeded?

Comment. Every board ought to have some questions on bacteriology and immunization because of the importance of these subjects.

LEGAL PHARMACY.

1. (*a*) What qualifications are required under the laws of your state for license to practice pharmacy? (*b*) If there are two grades of licentiates, what is the scope or limitation of each?

2. (*a*) What authorities are recognized by the U. S. Government in determining the standard of quality and purity of drugs and medicines? (*b*) In case a drug or preparation departs from the legal standard, under what conditions may it be sold?

3. What is the implied contract under which every pharmacist practices his profession?

4. What inspectors may a pharmacist expect to visit him, and what law or laws may each be engaged in enforcing?

5. (*a*) What is the purpose of the "Harrison Act"? (*b*) What drugs are affected by it? (*c*) What are pharmacists required to do under this act?

Comment. Students should receive a thorough drill on laws pertaining to pharmacy, and boards should ask questions on them.

COMMERCIAL PHARMACY.

1. Do you estimate profits on cost or selling price? State your reasons.

The original contained a series of questions on the subject.

Committee { E. A. RUDDIMAN, *Chairman*, P. S. PITTENGER, C. A. DYE, E. D. DAVY, CHAS. O. LEE, C. W. JOHNSON, E. L. NEWCOMB, G. J. BEARD, E. N. GATHERCOAL, DANIEL BASE, A. H. CLARK.

COLORS AS CURATIVES.

At a recent meeting of the Allied Medical Associations of America in New York City, a member explained how colors operate in restoring health; he said that drugs function by disengaging the colors composing them into the body. Thus a person suffering from malarial fever takes quinine; the blue wave of which the latter is composed, he said, "drives out the fever and cures the patient."

A daily paper comments thereon:—

"It is perhaps fitting that it was at a gathering of 'medical men' where it was calmly reported that vivisection had yielded no results and that the color cure was advanced as a specific for sick humanity. That a few primary facts as to the value of sunlight as an agency of health should take on the form of folderol that gives high curative and emotional values to the colors of the spectrum is only another indication of the kind of thing done by folk who rush in where angels fear to tread.

"That in this day of exact science the effect of quinine on the malarial parasite is described as the action of 'blue waves which drive the fever out and cure the patient' would seem to be incredible were the dispenser of this color nostrum not seemingly proud of his work. The account of the color cure, indeed, reads like a description of medicine as practiced on the upper Yang-tse-Kiang or in the desert of Gobi, to which secluded place Madame Blavatski cautiously retired her theosophic mahatmas. But the pity of it is that with the triumphs of preventive medicine never so considerable, with surgery daring ever to overcome new impossibilities, a certain kind of medical foolery is apparently enjoyed by the public. After all, Barnum did tell the truth."

NEW ORLEANS, THE CONVENTION CITY OF THE AMERICAN PHARMACEUTICAL ASSOCIATION FOR 1921—WEEK OF SEPTEMBER 5.

What lends New Orleans its charm? What makes it more popular among delegates to conventions than any convention city in America? Why is it that visitors to the quaint, yet modern city near the Gulf, can never completely forget its charm; can never quite get the desire to return out of their blood?

The answer to these questions is contained in three words. New Orleans is unique.

It is unique because of its historical interest—because of its many time-worn, old-fashioned, low-storied buildings, with their historical associations.

It is unique because of the charm of its people, in many of whom the spirit of hospitality, for which New Orleans and the South are famed, still survives.

It is unique because its thermometers never go above a hundred degrees nor under twenty.

It is unique because of the superlativeness of its cuisine, and the excellency of its accommodations for visitors.

The visitor to New Orleans has first of all the "French Quarter" so-called, although it is the section of the city developed under French and Spanish régime. This is a never-ending series of wonders for the inquisitive traveler.

Imagine yourself in the center of one of the most modern and progressive cities in the country, yet within walking distance of the Old Absinthe House, from which the pirate Lafitte issued orders which were as dreaded in New Orleans as they were on the shores of Bayou Barataria.

There is the "Haunted House" where Madame Lalurie entertained Lafayette on one floor, while on the floor above, she had her slaves chained and undergoing a process of torture. Her house was later burned by an angry mob, but it is commonly believed that the sobs of her black victims still reverberate through the halls of the structure that was raised on its site, and that chains rattle at midnight.

There is Jackson Square, formerly known as the "Place d'Arms," where everything in old New Orleans began and ended. It was here that the domination of Spain ended, to give way to beloved French rule. It was here that criminals underwent unspeakable torture, being nailed alive in their coffins and sawed in two.

Surrounding Jackson Square, there is the Cabildo, built by Don Andres Almonaster y Roxas in the latter part of the eighteenth century, as a legislative assembly for Spanish "regidors," and now the resting place for the priceless collection of relics of Louisiana history which the Louisiana Museum has committed to its care.

Then there is the Cathedral of St. Louis, just next to the Cabildo, on which Don Almonaster spent $50,000, and asked that mass be said for him every Saturday afternoon.

On each side of and facing Jackson Square, there are the Pontalba buildings, which were frequented by all that was best in New Orleans society. They were erected in 1849 by Michaela Leonardo, Baroness de Pontalba, the only child of Don Almonaster. Until recently, they were occupied chiefly by Italians and Syrians. A few months ago a movement was launched in New Orleans to make the Pontalba buildings the art colony of the city, and it is believed that in a short time the buildings will be given over almost entirely to artists' studios.

LIQUID IODOFORM.

The *Chemist and Druggist* reprints a Spanish formula for liquid iodoform as follows:

Potassium hydroxide	70 Gm.
Distilled water	50 Gm.
Alcohol (90%)	70 Gm.
Oleic acid	100 Gm.
Iodine	60 Gm.

The potassium hydroxide is dissolved in the water, and the oleic acid and alcohol added; then the finely powdered iodine is gradually added to the mixture in small quantities. At the conclusion of the reaction the liquid has a light brown color; it is allowed to stand for a few days in the dark, when the supernatant liquid portion is poured off. This is light yellow in color, and soluble in water, ether, chloroform, and fatty oils.

EDITORIAL NOTES

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REPORT ON EGYPTIAN GUMS AND OTHER DRUGS.

Professor Perrot, of the Paris Faculty of Pharmacy, has returned from a trip to the Far East, where he had gone to study the gums of the Egyptian Sudan. In an extended report he describes various gums, present methods of collections and suggests improvements; also a scientific standard of comparison, based on adhesion, viscosity, solubility, color, etc. He remarks that Sudan senna, *Cassia obovata*, is not official, yet this was the first known to botanists; this seems to be the only species indigenous to French West Africa, and worthy of investigation. He also refers to Egyptian henbane, *Hyoscyamus muticus*, which is rich in atropine. The report is accompanied by interesting snapshots.

WILD FLORA DO NOT ALWAYS GROW IN MOST CONGENIAL HABITAT.

At a lecture given in Chicago before an assemblage of geographers and biologists representing several societies, Dr. D. T. MacDougal, director of the botanical research department of the Carnegie Institution of Washington, described the results of a series of experiments extending over fourteen years and embracing 139 species of plants, the experiments tending to show that the wild plant is not always found in the environment most suited to it.

The coastal laboratory at Carmel-by-the-Sea and the desert laboratory at Tucson, Ariz., are two of the experimental stations which were used in this work. In these experiments plants from the mountain tops, some from the height of close to one and one-half miles above sea level, were found to grow much more luxuriantly, producing more leaves, flowers and fruits at sea level than they had in their native habitat. These plants were not cultivated, protected or fostered in any way in their new situations. Once placed, they were to all intents and purposes wild flowers and had to fight their own battles and take chances as before.

THE CENTENARY OF THE FRENCH ACADEMY OF MEDICINE.

The Academy of Medicine was founded by Royal decree of King Louis XVIII, continuing the work of the Royal Society of Medicine and the Royal Academy of Surgery, and responsive to the demands of the Government in everything concerning public hygiene, the examination of new remedies, etc. The ceremonies continued for three days, beginning December 20, the day on which, one hundred years ago, the ordinance of King Louis was issued. The opening was presided over by the President of France. Relative to the constitution of the Academy we are quoting from the *Chemist and Druggist* of January 1, 1921:

"There were originally three sections: Medicine (forty-five titulary members and thirty honorary), Surgery (twenty-five titulary, twenty honorary), and Pharmacy (fifteen titulary, ten honorary); besides various associates ('free,' 'ordinary,' and 'foreign') and 'adjoints.' Although the new body was ultimately destined to be self-elective, the first nominations were made by the King. Louis XVIII named, for the Pharmacy Section, Vauquelin, director of the Paris School of Pharmacy; Lougier, assistant director; Professors Deyeux and Robiquet, and Assistant Professors Pelletier and Henry. Besides these school officials, he appointed the Royal Head Pharmacist, Fabre, and two Parisian pharmacists, Boullay and Planche. All these were

'titularies.' The 'honorary' pharmaceutical members were Professor Bouillon-Lagrange and Assistant Professor Bouriat, Cheradame (treasurer of the school), and three retired pharmacists, Cadet de Vaux, Charlard, and Boudet (the uncle). Within the following year these elected six new titulary members: Caventou (who had just distinguished himself by his discovery of quinine), Clarion (ex-pharmacist to the Emperor Napoleon I), Boudet (the nephew), Cadet, Laubert (head pharmacist of the Army), and Derosne. The 'adjoints' included such names as Berthelot, Chaptal, Cuvier, Gay-Lussac, Geoffroy de St. Hilaire, Lacépède, and Thénard. Considerable alteration has been made. The three sections have been increased to eleven, Pharmacy being now the eleventh. The distinction between honorary and titulary members was abolished and various other changes made, but the *raison d'être* of the Academy is very like what it was a hundred years ago. Much might be written as to the interesting personalities of the members of the Academy of Medicine of 1920. Clarion, for instance, was an ex-private of Bonaparte's famous 'Army' of Italy before he entered the Deyeux's laboratory. He was in charge of the Imperial Pharmacy at St. Cloud when Wellington and Blücher marched on Paris after Waterloo. The grim old Prussian Marshal proposed to carry off the contents of the pharmacy for his ambulances, but, thanks to Clarion's energetic attitude, he was induced to abandon his intention, and the French Government retained possession of 150,000 fr. worth of medical stores. As soon as the Bourbons were restored, the old soldier of the Empire promptly offered to resign the post where he had served so well, but Louis XVIII sent a high official to beg him to retain it. When General Bonaparte decided to study chemistry, Bouillon-Legrange was recommended by Berthelot to give the necessary demonstrations, and Napoleon and Josephine both keenly appreciated the young professor's skill. The Pharmacie Vigier, well known to all Parisians, was once Bourriat's *officine*, and the name of Charlard may still be seen on a chemist's frontage on the Boulevards."

Prof. Émile Bourquelot, elected the 1921 Vice-President of the Academy of Medicine, was born in 1851 in the Ardennes. He was called to the chair of Galenical Pharmacy in 1897. (For brief sketch see THIS JOURNAL, p. 757, August 1920.)

THE U. S. PHARMACOPOEIA IN CHINESE.

According to reports received by the U. S. Bureau of Foreign and Domestic Commerce, from Commercial Attaché Arnold, an American publishing house in China is contemplating a standardization in Chinese of the U. S. Pharmacopoeia.

Mr. Arnold believes that if the Chinese could be induced to recognize that drug standard it would be a big step in the development of our chemical and drug trade in that country, as American standards would then have general recognition and American manufacturers would be in a particular position of advantage. This is particularly desirable at this very important time in China, he adds, when the people are building up institutions patterned after the western models. Reference is made to the German influence on the Japanese pharmacopoeia.

INFLUENCE OF CHEMISTRY ON MEDICINE.

F. W. Andrews, writing in the *Lancet*, October 23, 1920, states that chemistry has influenced medicine from the days of alchemy onward; Paracelsus and Van Helmont stand out as picturesque figures in its history. In England the rise of physics and chemistry began in Harvey's lifetime with those meetings of scientific men which later gave birth to the Royal Society. It must not be forgotten that the work of such men as Boyle, Hooke, Lower, and Mayow practically solved the problem of respiration not long after Harvey's death—a problem second only in importance to that of the circulation—though a century was to elapse for its full meaning to become clear with the discovery of oxygen. Every advance in physics and chemistry has borne fruit for us in its turn; to-day we can almost affirm that the chief issues in physiology and pathology are to be sought in the chemical activities of the human body. These, again, are bound up with physical conditions, and there is one recent branch of chemistry, the possibilities of which are only beginning to be appreciated in medicine. If we reflect that the body, from a chemical point of view, consists almost entirely of colloids, the behavior of which is still imperfectly understood, it will be realized that advances in colloidal chemistry are destined to throw a flood of light on the processes of vital activity.

DESTROYING OUR CONSULAR SERVICE.

In a letter to the *New York Commercial*, Hon. William C. Redfield adds his protest to that of manufacturers and business men, to preserve and strengthen the Consular Service. He writes:

"The action of the House Committee on Appropriations in reducing the funds for the operations of the consular and diplomatic service is one against which a widespread protest should and doubtless will be made. It calls for prompt action on the part of organized business bodies and of all business houses interested in our foreign trade.

"Strangely enough the report which accompanies the bill gives the best of reasons why the bill should be different. It points out the value of doing that which it refuses to have done and offers unanswerable reasons why the services should be at the least maintained if not increased instead of being sharply reduced.

"This is no time to kill the goose that lays the golden egg. Neither is it the time to cut down either the quality or the quantity of American representation abroad. Surely those have little vision who do not see that our country needs more than ever before to have its consular and diplomatic services maintained on the broadest and most efficient basis.

"These services have done their work admirably and the value of their services increases from year to year. The interests placed in their care were never as large and as important as they are to-day.

"It would be ridiculous if it were not tragic to select this particular productive work for an exhibition of parsimony.

"I hope that the business world will so make its voice heard that this most unfortunate action will be blocked before it is too late."

PERSONAL AND NEWS ITEMS.

George V. Haering, Madison and Jefferson Streets, Chicago, has been elected president of the Chicago Retail Druggists' Association.

Ambrose Hunsberger is the 1921 president of the Philadelphia Retail Druggists' Association. He is also chairman of the Arrangement Committee for the 1921 meeting of the Pennsylvania Pharmaceutical Association.

S. A. Eckstein, Milwaukee, was elected president of the Wisconsin Pharmacal Company; **E. G. Raeuber** is the secretary-treasurer.

Joseph C. Piercy, Tonopah, Nev., is a member of the State legislature, a member of the Nevada Board of Pharmacy, and a director of the Tonopah school board.

George W. Smith, Honolulu, has sold his controlling interest in Benson, Smith & Co., to W. C. McGonagle; Mr. Smith continues as a director in the corporation.

Prof. J. U. Lloyd is convalescing in an entirely satisfactory manner, but he will not resume his work in the laboratory for some time.

Dr. H. H. Rusby has been confined to his home by an attack of influenza; we are advised that he is recovering.

Thomas H. Potts, former secretary of the N. A. R. D., is now a resident of New York City. He is vice-president and secretary of the American Medical Products Co.

Jesse L. Hopkins has been re-elected treasurer of the New York Board of Trade and Transportation.

Miss Neida Humphreys, daughter of **J. D. Humphreys**, Huntsville, Alabama, has made her début as prima donna at the Castanzi in Rome, Italy, in grand opera. Miss Humphreys received her musical training in New York City and has appeared at Carnegie Hall and Madison Square Garden.

Carl F. G. Meyer, of Meyer Bros. Drug Co., was re-elected president of the St. Louis Drug & Chemical Club.

The **La Pierre** Drug Co., of Boston, celebrated its fiftieth anniversary on January 3.

Dr. Carleton Simon, the alienist and criminologist, is special deputy police commissioner of New York City, in charge of drug cases.

Dr. Herman Schlundt, professor of chemistry in the University of Missouri, at Columbia, Mo., is in Europe to spend a leave of absence in the Cavendish laboratory at Cambridge University, England. He will be associated there with Sir Ernest Rutherford in the study of radioactive substances and their radiations.

Dr. William Duffield Robinson, who had charge of the dinner in honor of Dr. W. W. Keen, is president of the Alumni Association of the Philadelphia College of Pharmacy.

Dr. Frederick G. Cottrell recently resigned as director of the U. S. Bureau of Mines to become associated with the National Research

Council. When a young chemist in a California university, Dr. Cottrell transferred to the Smithsonian Institution his patent for a successful process of curing the smoke evil, which made possible the collection of potash from the smoke-stacks of blast furnaces. The earnings from this patent have been used to further scientific research for the benefit of American science and industry. The Research Council handles and administers the funds.

Prof. Émile Bourquelot recently read to the Academy of Medicine a review of his twenty years' study of glucoside in plants. He has discovered (by his biochemical method in his own laboratory) fifteen new glucosides, all laevogyrate, which may be hydrolyzed by emulsine. Many of these glucosides are found in plants of widely different botanical species. Glucosides have thus been discovered and isolated in fifty-six species of plants. Of 281 phanerogams examined in his laboratory 205 have been found to contain glucosides. There are, therefore, still 149 of which the glucosides have to be isolated.

Dr. W. W. Keen Honor Guest at a Dinner.

The past, the present and the future were viewed and reviewed from the apex of eighty-four years of life by Dr. W. W. Keen at his birthday party, January 20, at the Bellevue-Stratford, Philadelphia. He said:

"Eight epoch-making medical events have transpired in my life. They are anesthesia; Pasteur's researches—the foundation of the new science of bacteriology; Pasteur's fundamental discoveries in immunology, or the science of specific prevention of disease; Pasteur's and Lister's researches resulting in antiseptic and aseptic surgery in obstetrics; the discovery that insects carry diseases; the discovery of radio-activity and, especially for medical use, the X-ray; the development of a medical literature written by American authors; the founding of the great laboratories of research.

His spirit is shown by the following:

"Mix merry laughter with earnest labor. Always have some as yet unfinished, but not too urgent job waiting outside your door. Then you will never know ennui. To 'kill time' is murder in the first degree.

"Ultimately, no doubt, I shall get out of your way, but do not overlook the fact of my maliciously good health and that a collateral forbear reached the mature age of one hundred and six."

More than five hundred guests were present and congratulations came from all parts of the world.

OBITUARY.

AUGUSTUS GEORGE SCHLOTTERBECK.

Augustus G. Schlotterbeck, for 60 years engaged in the drug business in Portland, Me., died January 3. He was the last charter member of the Maine Pharmaceutical Association, organized half a century ago. Born in Birstein, Germany, 77 years ago, he came to this country when 10 years of age, and had lived in Portland since 1865. He was known as the "father" of the local Masonic Temple, having taken an active part in financing the construction of the building.

Mr. Schlotterbeck joined the American Pharmaceutical Association in 1896. A sketch appeared in THIS JOURNAL, April 1917, p. 339.

CHARLES H. SCHMIDT.

We have notice of the death of Charles H. Schmidt, member of the American Pharmaceutical Association, Hoboken, N. J., January 14. At this writing we have no data from which to prepare a sketch.

MRS. SIDNEY J. COFFEE.

We are advised of the death of Mrs. Sidney J. Coffee, Missoula, Mont. Besides her husband, one son and one daughter survive the deceased.

J. E. BARNABE.

J. E. Barnabe, president of the Canadian Pharmaceutical Association, 1919–1920, died at his home in Montreal, December 3. He was also a past president of the Quebec Pharmaceutical Association, and a member of the pharmaceutical examining board of that Province.

DR. HENRY A. BUMSTEAD.

Dr. Henry A. Bumstead, head of the National Research Council, died while en route from Chicago to Washington, Saturday, January 1. He was a noted physicist and was working out a great constructive program for the council. He had a laboratory at Yale University.

During the war Dr. Bumstead was an at-

taché of the American embassy at London and served as the channel through which this government communicated such technical secrets as were deemed proper for the Allies' governments to have.

WILLIAM H. OSBORN.

William H. Osborn, United States Commissioner of Internal Revenue from 1913 to 1917, died at his home at Greensboro, N. C., January 3. He was born February 21, 1856, at Oxford, N. C.

JOHN M. PARKER.

John M. Parker, connected for many years with Merck & Co., 45 Park Place, New York, died January 10.

Mr. Parker was born August 21, 1871, at Glencairn, Letterkenny, County Donegal, Ireland. He came to this country in 1887 and in December 1888 he joined the staff of Merck & Co., with whom he remained until his death. In 1893 Mr. Parker married Miss Minnie Morrison, who survives him.

JOSEPH G. ROSENGARTEN.

Joseph George Rosengarten, lawyer, writer, patron of literature, known for charitable works and public benefactions, trustee of the University of Pennsylvania for more than twenty years, died January 14.

He was eighty-five years of age and resided in Philadelphia all his life. His long career following his graduation from the University of Pennsylvania, of which he was one of the oldest graduates, was filled with varied interests.

Because of the recognition which he gave in books and addresses to French influence and contributions to American interests, Mr. Rosengarten was made a Chevalier of the Legion of Honor by the French Government.

He is survived by two brothers and a sister. They are Harry B. Rosengarten, head of the Powers-Weightman-Rosengarten Co., Frank H. Rosengarten, and Fanny Rosengarten. He was never married and made his home with his sister.

GUY THOMAS KETCHESON.

Guy Thomas Ketcheson, publisher of the *Pacific Drug Review* since 1904, died at his home in Portland on the morning of December 20, after an illness of about ten days. An affection of the heart, which for some time past had threatened serious complications, was the immediate cause of death. He was thirty-five years old.

Mr. Ketcheson was born in Leavenworth, Kansas, and when but a youth entered the field of drug trade journalism, serving his apprenticeship under H. R. Strong, of the *National Druggist*, of St. Louis. After purchasing the *Pacific Drug Review* he gave himself singly and wholeheartedly to the task of building up the publication, and was eminently successful in his endeavor.

SOCIETIES AND COLLEGES.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

The seventy-third meeting of the American Association for the Advancement of Science was held in Chicago, December 27 to January 1. The subject of the address of the retiring president, Dr. Simon Flexner, was "Twenty-five Years of Bacteriology." President L. O. Howard, chief of the Bureau of Entomology, presided; Prof. E. H. Moore, of the University of Chicago, is the president-elect. The next convention will be held in Toronto.

Among the resolutions adopted by the Council of the American Association are the following:

Be it Resolved, That the American Association for the Advancement of Science would welcome the organization of Mexican men of science, and their affiliation with this Association.

Resolved, That a committee of seven be appointed to coöperate with such organization as Mexican men of science may form.

The suggestion is made by the Editor that similar action be considered by the American Pharmaceutical Association. It is true that an effort of this kind was made a number of years ago without any degree of success. There seems to be developing a closer relationship and a desire for coöperation. Only a very few would be interested, but the step might lead to the recognition of the U. S. Pharmacopoeia and National Formulary which, in the writer's opinion, is an important consideration.

THE NEW ORLEANS A. PH. A. MEETING.

A banquet was given in New Orleans by the Louisiana members of the American Pharmaceutical Association, January 27, at

the Restaurant de Louisiane. The dishes of the inviting menu were named for the officials of the Association. Fred. W. Ames presided as toastmaster, and among the speakers were Messrs. Adam Wirth, George McDuff and W. F. Duplantis. Robert F. Grace stated that the affair was a forerunner of others to develop enthusiasm for the convention of the American Pharmaceutical Association, to be held in New Orleans during the week of September 5. The local papers gave considerable space for reporting the entertainment, which was followed by a dance.

EXAMINATIONS FOR GOVERNMENT BIOLOGISTS AND MICROANALYSTS.

The United States Civil Service Commission announces an open competitive examination for biologist. Two vacancies in the Hygienic Laboratory, Public Health Service, Washington, D. C., at $2,500 to $3,000 a year, and vacancies in positions requiring similar qualifications, at these or higher or lower salaries, will be filled from this examination, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion. The duties of appointees will consist of research work in the elaboration of drugs for the treatment of tuberculosis. The duties of the positions at present vacant involve biological studies of the permeability of tubercle bacilli and tubercles to drugs.

The positions to be filled by microanalysts are in the Bureau of Chemistry and the salaries range from $1,200 to $1,800 per year. The duties of appointees will include the microanalysis of such substances as foods and drugs in connection with the enforcement of the food and drugs act, as well as miscellaneous work on papers, textile materials, miscellaneous agricultural products, and such inorganic substances to which microanalytical methods are adapted. In connection with these problems more or less investigational work will be involved.

Applicants should apply at once as the time for receiving applications closes March 15. Applications should be made on proper forms which may be obtained from the Civil Service Commission, Washington, D. C.; the Secretary of the United States Civil Service Board, Customhouse, Boston, Mass., New York, N. Y., New Orleans, La., Honolulu, Hawaii; Post Office, Philadelphia, Pa., Atlanta, Ga., Cincinnati, Ohio, Chicago, Ill., St. Paul, Minn., Seattle, Wash., San Francisco, Calif.; Old Customhouse, St. Louis, Mo.; Administration Building, Balboa Heights, Canal Zone; or the Chairman of the Porto Rican Civil Service Commission, San Juan, P. R.

MID-WINTER CONVENTION IOWA PHARMACEUTICAL ASSOCIATION.

The 1921 Mid-winter Convention of the Iowa Pharmaceutical Association was held in Des Moines, February 2 and 3. Quoting from the program, the principal speakers were Dr. Conkling, of Government Health Department; Governor N. E. Kendall, Lieutenant Governor Hamill, Dr. J. H. Beal, Prof. E. L. Newcomb, Secretary S. C. Henry, N. A. R. D.; Thomas Maloney, Iowa prohibition enforcement officer, Attorney General B. I. Gibson, and J. A. Gunn. The following are the officers of the Association:

President, A. C. Philipp, Manchester.
First Vice-President, H. L. Jones, Clarinda.
Second Vice-President, George Judisch, Ames.
Third Vice-President, M. B. Herrald, Boone.
Secretary, Al. Falkenhainer, Algona.
Membership Secretary, H. E. Eaton, Des Moines.
Treasurer, J. M. Lindly, Winfield.

MINNESOTA PHARMACEUTICAL ASSOCIATION.

The 1921 meeting of the Minnesota Pharmaceutical Association was held in St. Paul, February 7 to 9, President E. L. Newcomb presiding. Among the speakers of the convention the following were announced: Governor J. A. O. Preus, Lieutenant Governor Louis Collins, Hon. W. I. Nolan, Dr. H. H. Frost and Secretary S. C. Henry, of the N. A. R. D.

The Northwestern Branch of the American Pharmaceutical Association met jointly with the Scientific and Practical Section. The following program was presented, and Dean Frederick J. Wulling presided:

1. "The Medicinal Flowers and Plants of Northern Minnesota," G. J. DeMars, Fertile, Minn.

2. "The Practice of Red Cross Pharmacy in Siberia by an American," Howard Gross, Watertown, S. D.

3. "Narcotic Drug Situation," Earl N. Greenberg, Minneapolis.

4. Report of Committee on College of Pharmacy, A. J. Kline, Minneapolis.

5. "Propaganda," H. C. Kruckeberg, Minneapolis.

6. Report on U. S. P. and N. F. Revision Work, Dr. E. L. Newcomb, Minneapolis.

7. "The Smiling Druggist," A. H. Fjeldstad, Minneapolis.

8. Report on Drug Adulteration, Dr. G. Bachman, Minneapolis.

9. "The Opportunities Which the Hospital Offers to the Pharmacist," Miss Frances Greenwalt, St. Paul.

10. The College of Pharmacy, Annual Historical Paper, Dean F. J. Wulling, Minneapolis.

11. "Increasing Pharmaceutical Practice," L. J. Aberwald, St. Paul.

12. "Professional Pharmacy," J. H. Ostedt, St. Paul.

13. Paper by Dr. C. H. Rogers, Minneapolis.

14. "The Workings of the Prerequisite in the State of Minnesota," J. P. Jelinek, St. Paul.

15. Report Committee on Practical Pharmacy.

16. Report Research Committee.

17. Report Committee on Drug Plant Culture.

18. Report of Committee on U. S. P. and N. F.

The officers of the 1920–1921 convention follow:

President, Edwin L. Newcomb, Minneapolis.

First Vice-President, Harry Trowbridge, Austin.

Second Vice-President, C. O. Diessner, Waconia.

Third Vice-President, Theo. A. Arneson, Montevideo.

Secretary, Gustav Bachman, Minneapolis, Minnesota.

Treasurer, R. J. Messing, St. Paul.

OHIO PHARMACEUTICAL ASSOCIATION.

News bulletin number two, issued by the Ohio State Pharmaceutical Association, contains the following announcements:

"The Ohio State Pharmaceutical Association will hold its 42nd semi-annual convention in Columbus, February 3rd and 4th, at the Chittenden Hotel. A very interesting program including questions of legislation, taxation and prohibition has been arranged. Such well-known speakers as Governor Davis; James A. White, superintendent of the Anti-Saloon League; C. C. Crabbe, floor leader of the House of Representatives; John S. Shearer, prohibition director; Samuel C. Henry, secretary of the N. A. R. D.; and prominent members of the association will add class to the program.

"The officers are:

President, Frank Schwilk, Dayton.

First Vice-President, H. M. Highfield, Zanesville.

Second Vice-President, Thomas J. Evans, Newark.

Secretary, Theo. D. Wetterstroem, Cincinnati.

Treasurer, L. W. Funk, Columbus."

NORTH CAROLINA PHARMACEUTICAL ASSOCIATION SEEKS REPRESENTATION ON STATE HEALTH BOARD.

The North Carolina Pharmaceutical Association is making a strong effort to secure the appointment of a pharmacist on the State Health Board. The appointment of a qualified pharmacist would increase the efficiency of the service, and be typical of the interests regulated, and concerned in health conservation.

PHILADELPHIA DRUG EXCHANGE.

The following officers were elected for 1921, at the annual meeting of the Philadelphia Drug Exchange:

President, Harry B. French.

Vice-President, Charles E. Hires.

Secretary, Joseph W. England.

Treasurer, Anthony M. Hance.

Directors—Milton Campbell, Herbert R. McIlvaine, Adolph W. Miller, Adam Pfromm, C. Stanley French, Clayton F. Shoemaker, A. L. Hilles, Jr., Walter V. Smith.

The annual banquet was given at the Bellevue-Stratford, January 27. The speakers of the occasion were former Senator George Wilder Cartwright, of California; Richard Spillane, on "What Ails Us;" Rev. William L. McCormick, on "Religion in Business;" Hon. Fletcher W. Stites on "Foundation of Government." Dr. H. H. Rusby was to speak on "The Drug-Collecting Industry in South America," but was prevented by sickness.

Seldom do banquet speeches carry such timely messages; they were responsive to the needs of the hour. Truth and coöperation were keynotes, and also consideration of fellow-men and nations for right and justice. Some of the points presented may be stated in this way:

"There is nothing more vital to the welfare of our people and the nation itself at the present time than a proper relationship and understanding between employers and employes.

"The interest of the employer and the employe is identical—one's success depends upon the other. The employe cannot find work without capital to supply the necessary tools, materials and management; capital cannot secure production without employes. Thoughtful and unbiased consideration makes us all realize our dependence upon one another.

"There is no place in our present industrial life for covering up things. What we need is frank, honest discussion and a clear exposition of fundamental facts set forth in a way that will be perfectly understandable and not subject to honest contradiction. No class feeling must be permitted to enter into our national structure if our country is to maintain its freedom and occupy an unprejudiced and neutral leadership in world affairs."

PURDUE UNIVERSITY.

The students and alumni of Purdue University are in the midst of a campaign to raise one million dollars for a student Union Building. Thus far the campaign has been a very successful one. The students of the University have pledged $365,000 and this, with the alumni pledges added to it, will make a total of about $750,000, or three-fourths of the proposed amount. The pharmacy alumni have done their part and have pledged an average of $130 per student. Mary Katheryn Shoup of Warsaw, Ind., is leader for the department and much of the success of the campaign is due to her efforts. The building is now assured and ground will soon be broken for it. It will be built on the plan similar to the new Student Union Building, at Michigan.

OKLAHOMA UNIVERSITY.

Walter R. Jarrett, secretary of the Oklahoma Board of Pharmacy, includes in his annual report recently submitted to Governor Robertson, of that State, a recommendation that the sum of $250,000 be appropriated to construct a building for the use of the school of pharmacy of the University of Oklahoma at Norman. In making the recommendation he refers to the present crowded conditions at the school.

UNIVERSITY OF MARYLAND.

A survey is being made of the members of the several faculties of the University of Maryland, now a State institution at Baltimore. The survey includes detailed data about all of the members, including the teaching staff of the Department of Pharmacy, blanks being sent out on which the instructors are requested to state their age, place of birth and other personal details, along with their scholastic attainments, such as the degrees they hold and where they attended lectures. The survey is believed to have some connection with information desired by the Rockefeller Foundation on the standing of American colleges.—*Pharmaceutical Era.*

PHILADELPHIA COLLEGE OF PHARMACY AND SCIENCE.

Founder's Day of the Philadelphia College of Pharmacy and Science will be appropriately celebrated on February 23, 1921, a date which marks the hundredth anniversary of the organization of the college in the historic building, Carpenter's Hall.

THE PHARMACIST AND THE LAW.

PROPOSED MODEL STATE PROHIBITION BILL.

The following model State prohibition bill was agreed to at the recent Washington Conference of the largest users of alcohol for non-beverage purposes. It is submitted as a guide for those who have the responsibility of framing such State legislative measures. It follows closely along the lines of the Volstead Act, and obviates the necessity of keeping additional records, other than those required under the federal law.

A BILL.

To prohibit the liquor traffic and to provide for the administration and enforcement of such prohibition.

Be it enacted by the General Assembly of the State of.....

Section 1. This act shall be deemed to be an exercise of power granted by the Eighteenth Amendment to the Constitution of the United States and the police power of the state and its provisions shall be liberally construed to carry out the provisions of this act.

Section 2. In the interpretation of this Act (1) the word "liquor" or the phrase "intoxicating liquor" shall be construed to include alcohol, brandy, whisky, rum, gin, beer, ale, porter, and wine, and in addition thereto any distilled, spirituous, malt, vinous, or fermented liquor, and also any liquid or compound whether or not the same is medicated, proprietary, or patented, and by what-

ever name called, containing one-half of one percent or more of alcohol by volume which is fit for use for beverage purposes: Provided, that the foregoing definition shall not extend to de-alcoholized wine, vinegar or preserved sweet cider, nor to any beverage or liquid produced by the process by which beer, ale, porter, or wine is produced, if it contains less than one-half of one per centum of alcohol by volume, and is made as prescribed in Section 37, Title II of the Act of Congress known as the "National Prohibition Act" passed October 28, 1919.

2. The term "given away" and the term "possess" shall not apply to intoxicating liquor in a bona fide private dwelling.

3. The word "person" shall mean and include actual persons, firms, associations, co-partnerships and corporations.

4. The term "alcohol" shall mean ethyl alcohol: whoever knowingly sells, furnishes or gives away wood alcohol or any preparation or compound containing wood alcohol, to be used for beverage purposes, and death results therefrom, shall be guilty of murder.

Section 3. No person shall, after the passage of this act, manufacture, sell, barter, transport, import, export, deliver, furnish, receive, give away, prescribe, possess, solicit or advertise any intoxicating liquors, except as authorized in this act. Liquor, and liquor preparations or compounds for non-beverage purposes, and liquor and liquor preparations or compounds for non-intoxicating beverage purposes, and wine for sacramental purpose, may be manufactured, purchased, sold, bartered, transported, imported, exported, delivered, furnished, received, given away, possessed, prescribed, solicited and advertised, but only in accordance with the provisions of the act of Congress known as the "National Prohibition Act," passed October 28, 1919, or any amendments thereto.

Section 4. No person without first having a permit from the United States Commissioner of Internal Revenue in conformity with the National Prohibition Act to engage in this state in the business of manufacturing, using, selling, purchasing, transporting or prescribing any liquor, or to sell any wine for sacramental purposes, or to manufacture any liquor or liquor preparations or compounds for non-beverage purposes, or to manufacture any liquor, or liquor preparations or compounds for non-intoxicating beverage purposes, shall manufacture, use, sell, purchase, transport or prescribe any liquor or sell any wine for sacramental purposes, or manufacture any liquor preparations or compounds for non-beverage purposes, or manufacture any liquor, or liquor preparations or compounds for non-intoxicating beverage purposes, respectively, and unless the person obtaining such permit shall also within ten days after receiving the same file a copy thereof with the Secretary of State; provided, that the affidavit of the person to whom the permit has been issued, or his agent, to the effect that the same is a true copy of the original permit, shall be attached to said copy. The Secretary of State on receiving said copy shall immediately file the same, and appropriately index the same in a separate book to be kept for that purpose in his office, which book shall be at all times open to public inspection; provided, further, that this Act shall not apply to ethyl alcohol lawfully denatured in accordance with formulae prescribed by the Commissioner of Internal Revenue under the provisions of Section 10, of Title III of the National Prohibition Act, or any amendments thereto. The Secretary of State shall receive a fee of $1.00, to be paid by the person filing the copy of the permit.

Section 5. A conviction of a person holding a permit, for the violation of any of the laws of this state relating to intoxicating liquors or for the National Prohibition Act, or the revocation of any permit issued by the United States Commissioner of Internal Revenue, a copy of which permit has been filed with the Secretary of State, as provided herein, and which revocation has not been reversed by any court of competent jurisdiction, shall automatically have the effect of striking the copy of said permit from the files of the Secretary of State, and the Secretary of State on receiving a certified copy of the docket or the journal entry, showing said conviction, shall make an entry in his register showing that the copy has been stricken from the files; provided, however, that any person so convicted may, within ten days after any such conviction before any Justice of the Peace, magistrate, police court, or any other court not of record in the county, apply to any court of record in the county or a judge thereof in vacation, for an order staying such judgment so far as it affects the striking of such copy of such permit from the files, and upon good cause shown the court or judge thereof may order such stay until such time as such conviction shall be finally determined. When such copy has been stricken from the files, it shall thereafter be unlawful for the person who filed the same

to engage in the business for which said permit was issued (unless a new permit be issued and copy filed as herein permitted), provided, however, where an appeal is taken or error is prosecuted, and the judgment of conviction is reversed, the person whose copy of permit has been stricken from the files shall be entitled to have the same re-filed, as in the beginning.

Section 6. Any officer charged with the duty of enforcing the laws of this state, or of the prohibition laws of the United States or any taxpayer of this state having good and sufficient reason to believe that the laws of this state or of the United States relating to intoxicating liquors or regulations made thereunder are being violated by any person, a copy of whose permit is on file in the office of the Secretary of State, may commence under oath in the county in which said permit holder may reside, or in any county where he may be legally served with summons. an action in any court having equity jurisdiction to strike from the files of the Secretary of State the copy of such permit, and to cancel and revoke all privileges granted thereunder. Such action shall be an action in equity for an injunction and if the court shall find that the defendant, the holder of the permit in question, is violating such law, then such court shall issue a decree enjoining the defendant from continuing the business authorized by said permit, a copy of which is filed with the Secretary of State. and upon the filing of a certified copy of said decree with the Secretary of State, the Secretary of State shall strike said copy of permit from his file.

A defendant who has been enjoined from continuing his business, under a permit, may prosecute error, or take an appeal as in other cases provided, and in case of reversal of said decree of injunction, he shall be entitled to have a copy of his permit refiled, as in the first instance.

Section 7. It shall be unlawful to have or possess any liquor, or property designed for the manufacture of liquor, intended for use in violation of law or which has been so used, and no property rights shall exist in any such liquor or property. A search warrant may issue, and proceedings had thereunder, as provided in sections.....to.....inclusive of the.....so far as the same may apply, and such liquor, the containers thereof, and such property so seized shall be subject to such disposition as the court may make thereof. If it is found that such liquor or property was so unlawfully held or possessed, or had been so unlawfully used, the liquor or property designed for the unlawful manufacture of liquor shall be destroyed unless the court shall order it to be disposed of as provided in public act 66 federal statutes. No search warrant shall issue to search any private dwelling occupied as such unless it is being used for the unlawful manufacture or sale of intoxicating liquor, or unless it is in part used for some business purpose such as store, shop, saloon, restaurant, hotel or boarding house. The term "private dwelling" shall be construed to include he room or rooms used and occupied not transiently but solely as a residence in an apartment house, hotel, or boarding house. The property seized on any such warrant shall not be taken from the officer seizing the same on any writ or replevin or other like process.

Section 8. Any person who violates the provisions of this act for a first offense shall be fined not less than one hundred dollars nor more than one thousand dollars; for a second offense he shall be fined not less than three hundred dollars nor more than two thousand dollars; for a third and each subsequent offense, he shall be fined not less than five hundred dollars nor more than two thousand dollars and be imprisoned in the state penitentiary not less than one year nor more than five years. The penalties provided in this act shall not apply to a person for manufacturing vinegar, or non-intoxicating cider and fruit juices exclusively for use in his home, but such cider and fruit juices shall not be sold or delivered after they become intoxicating except to persons having permits from the United States government to manufacture vinegar. Nothing herein shall be construed to prevent the sale of vinegar and said penalties shall not apply to any such sale.

Section 9. Any justice of the peace, mayor, municipal or police judge, probate or common pleas judge within the county with whom the affidavit is filed charging a violation of any of the provisions of this act, when the offense is alleged to have been committed in the county in which such mayor, justice of the peace, or judge may be sitting, shall have final jurisdiction to try such cases upon such affidavits and error may be prosecuted to the judgment of such mayor, justice of the peace, or judge as herein provided. And in any such cases where imprisonment is not a part of the penalty, the defendant cannot waive examination nor can said mayor, justice of the peace, or judge recognize such defendant to the grand jury; nor shall it be necessary that any informa-

tion be filed by the prosecuting attorney or any indictment be found by the grand jury.

Section 10. Money arising from fines and forfeited bonds shall be paid one-half into the state treasury credited to the general revenue fund, one-half to the treasury of the township, municipality or county where the prosecution is held, according as to whether the officer hearing the case is a township, municipal or county officer.

Section 11. A petition in error shall not be filed in any court to reverse a conviction for a violation of this act, or to reverse a judgment affirming such conviction, except after leave granted by the reviewing court. Such leave shall not be granted except for good cause shown at a hearing of which counsel for the complainant in the original case shall have had actual and reasonable notice. Such petition in error must be filed within thirty days after the judgment complained of, and the case shall be heard by such reviewing court within not more than thirty court days after filing such petitions in error. When the reviewing court is not in session within the time provided for, the motion for leave to file the petition in error and the petition in error may be filed with, and heard by, such reviewing court within ten days after it is in session.

Section 12. All acts and parts of acts or provisions of law inconsistent with this act are hereby repealed.

Section 13. The provisions of this act shall take effect and be in force on and after its passage.

APPENDIX.

The following amendment to Section 3 is to be used in states where the state constitution prohibits legislation by reference.

Strike out the second sentence of Section 3. Insert in lieu thereof, the following:

"(*a*) Wine for sacramental purposes; (*b*) liquor for medicinal purposes, when prescribed by a physician; (*c*) liquor for manufacturing and scientific purposes; (*d*) denatured alcohol and denatured rum; (*e*) medicinal preparations manufactured in accordance with formula prescribed by the United States Pharmacopoeia, National Formulary or the American Institute of Homeopathy that are unfit for use for beverage purposes; (*f*) patented, patent, and proprietary medicines that are unfit for use for beverage purposes; (*g*) toilet, medicinal and antiseptic preparations and solutions that are unfit for use for beverage purposes; (*h*) flavorings, extracts and syrups that are unfit for use as a beverage or for an intoxicating beverage purpose; (*i*) vinegar and preserved sweet cider, may be manufactured, purchased, sold, bartered, transported, imported, exported, delivered, furnished, received, given away, possessed, prescribed, solicited, and advertised within this state; provided, however, that all persons required to obtain permits as provided in Section 4 herein, shall file copies of such permits in the manner as in such Section 4 provided."

PROVISIONS OF THE METRIC STANDARDS BILL.

BY AUBREY DRURY, EXECUTIVE SECRETARY, WORLD METRIC STANDARDIZATION COUNCIL.

(Introduced in the Senate by Hon. J. S. Frelinghuysen. S. 4675.)

(Introduced in the House of Representatives by Hon. Fred. A. Britten. H. R. 15,420.)

MANUFACTURERS CAN USE PRESENT MACHINERY: Concerns can go on using the present machines even after the 10-year transition period, but then the product will need to be listed in metric dimensions. It is a matter of supreme importance to remember that the proposed legislation will not go inside the walls of any man's shop or factory and determine for him what actual dimensions he shall use in making his goods.

Section 12, Part 2, of the Bill expressly states: "That nothing in this Act shall be understood or construed as applying to the construction or use in the arts, manufacture, or industry, of any specification or drawing, tool, machine, or other appliance or implement designed, constructed, or graduated in any desired system."

GRADUAL METRIC STANDARDIZATION: Provision is made for the gradual advance to the decimal metric units of weights and measures during a transition period of 10 years.

IN COMMERCIAL TRANSACTIONS: It is important to note that this Bill enables the manufacturer to choose any weights and measures for use in production, but calls for the use of the metric system in commercial transactions. Here is an advance to simplicity in quantity expression, an application of arithmetic which need not affect workshop practice. The Bill concerns itself chiefly with the merchandising of goods.

METRIC MARKING: As part of the educational campaign, after 2 years all goods in package form will be labeled in metric units. But they may also be labeled in the old units for the 10-year transition period.

BOOK NOTICES AND REVIEWS.

The Chemistry and Analysis of Drugs and Medicines. By Henry C. Fuller. Published by John Wiley & Sons, Inc., New York. 1072 pp., index inc. Price, $10.00.

A book that will be welcomed by all who are interested in the investigation and analysis of drugs and medicines. It is a pleasure to read it, although it is impossible to review it with justice in the space allotted for this purpose.

"Whoever has taken up an investigation of drugs and medicines, whether in the line of analysis or research, must have been impressed with the fact that there has been no individual publication dealing with analytical procedures applicable to the subject as a whole.

"The analyst could turn to the Pharmacopoeia and National Formulary for methods of assaying and testing the official drugs, and to other works such as Autenreith and Warren's 'Detection of Poisons,' 'New and Non-Official Remedies' published by the American Medical Association, and the publications of the Association of Official Agricultural Chemists, where he would find information and perhaps methods applicable to certain classes of drugs and medicinal agents, but there has been no general analytical work embracing this branch of chemistry. The food analyst could turn to Leach's 'Food Inspection and Analysis,' and there find complete and latest methods for solving his analytical problems, but the drug analyst was less fortunate, and when presented with a problem of analysis outside the usual run of drug assaying, there was involved a long search through the available text books, technical journals, and official publications before a satisfactory procedure was found, if any existed.

"The work in hand has been published in order to remedy this situation.

"The material for it has been collected during the past seventeen years, and has been arranged in a way which it is believed will be found convenient to the worker who is handling miscellaneous analytical investigations."

The above, taken from the introduction, expresses the purpose of the book. The book fulfills the author's purpose.

Chapter I deals with general analytical methods. Crude drug assays are covered in Chapter II. In addition to the U. S. P. assay methods, one finds many others. Under Belladonna both U. S. P. VIII and U. S. P. IX methods are given and the author expresses his preference for that of the U. S. P. VIII. Several methods for the assay of opium are given. Among other drugs for which one or more methods are found, are rhubarb, pomegranate bark, mustard seed, hoang-nan and anhalonium. The "Lloyd Procedure" and "Physiological Methods" are described. The above are mentioned to direct attention to the thoroughness with which the author has treated his subject. This is true throughout the entire book.

Part II, comprising Chapters III to IX, inclusive, pages 71 to 281, is devoted to the alkaloids. After a description of general methods of separation and identification, the alkaloids are taken up in the following order: Alkaloids derived from pyridin; from pyrrolidin; from quinolin; from isoquinolin; those which probably contain a pyridin-nucleus, condensation unknown; those containing no pyridin nucleus; those of unknown composition. The source of the alkaloid is given, where it is found in the plant and in what combinations; how the plant, its preparations or the alkaloid are employed; in what kinds of galenicals and proprietaries it might be found; its therapeutic properties, real or claimed.

The alkaloid, its tests, compounds and in many instances its synthesis as well as method of termination are described. A few citations appear in order: Microchemical examination of alkaloids; Cytisin; Delphinium Bases; sixteen pages devoted to Solanum alkaloids; twenty-nine pages to Cinchona alkaloids and derivatives; Yobimbin; thirty-nine pages to Opium alkaloids and preparations containing them., *viz.*, paregoric, tablet triturates; pills, separation of morphine from heroine, etc.; nine pages to alkaloids of the Aconite Group; and so on. The so-called "synthetic anesthetics" are discussed immediately after the Coca alkaloids.

Part III, comprising Chapters X to XIV, deals with Glucosides; Purgative Drugs; Miscellaneous Acting Drugs; Botanical Drugs; Gums and Resins. In addition to the detailed technical facts, a great amount of general information of untold value to one engaged in the analysis of medicinal mixtures is given.

Chapter XV is devoted to hydrocarbons, alcohols and ethers; XVI to aldehydes and ketones; XVII, aliphatic acids; XVIII, aro-

matic acids; XIX, esters and phenols; XX, synthetic organic nitrogen compounds; XXI, anilides and phenetidines; XXII, organic arsenic compounds; XXIII, proteins and digestives; XXIV, oils.

Part V, Chapters XXV, XXVI and XXVII deal with the inorganics. Here we find the colloidal preparations of silver, mercury, etc.; the scale salts of iron, etc. In Chapter XXI, we find methods for the examination of "headache powders;" mixtures of acetanilid, quinine and morphine; of codeine, acetanilid and sodium salicylate, etc.

The amount of valuable information supplied by this one volume is astounding. It is bound to be a wonderful "time-saver" for the analyst, teacher, physician, research worker and drug official. All will ever want to have it within reach.

Of course in such a large undertaking some errors and inconsistencies were bound to creep in. The author has adopted the pharmacopoeial "mils," but drops the "e" from all alkaloids. "Chlorid" and "chloride" appear side by side as do "hydrochloride" and "hydrochlorate." We have "petroleum ether," "light petroleum ether" and "petroleum spirit;" we find the halogens with and without the final "e." The author prefers "ethereal salts" to "esters." The author has dropped the "V. S." so familiar to users of the U. S. P., using simply N/10, but under his list of reagents, he adheres to the expression of concentration in terms of per centum. Is it not more definite to express these in terms of normality? The statement is made that "methyl alcohol has only a limited use in medicinal preparations. It is employed as the vehicle in some liniments and 'balsams.'" Unless the writer is mistaken, such use is prohibited by law. These inconsistencies will undoubtedly disappear in future editions, and do not make the book one bit less valuable.

The index is somewhat of a disappointment, *viz.*, paregoric is not found under "P," but when one looks up morphine, one finds the assay method for the former. Lysol and creolin are not mentioned in the index although they are spoken of under the cresols.

The press-work is excellent, formulas are clear and distinct. The graphic ones are a pleasure to the eye. An immense amount of careful proof-reading has been done. The topics are conveniently arranged.

Mr. Fuller's ambitious efforts entitle him to congratulations and thanks from the many who will find his volume a necessary part of their every-day working library.

JEANNOT HOSTMANN.

A Treatise on Pharmacy. For Students and Pharmacists. By Charles Caspari, Jr., late Professor of Pharmacy in the Department of Pharmacy of the University of Maryland (Maryland College of Pharmacy, 1841 to 1904). Sixth edition, thoroughly revised by E. F. Kelly, Dean and Professor of Pharmacy in the Department of Pharmacy of the University of Maryland (Maryland College of Pharmacy, 1841 to 1904). Octavo, 954 pages, illustrated with 329 engravings; cloth, $8.00. Lea and Febiger, Publishers, Philadelphia and New York, 1920.

The fifth edition of this work appeared in 1916 following the publication of the U. S. P. IX. Since that time Prof. E. F. Kelly has succeeded Prof. Charles Caspari, Jr., following the death of the latter, as Professor of Pharmacy in the Department of Pharmacy of the University of Maryland, and on account of long association with the author of "Treatise on Pharmacy," Professor Kelly has fittingly undertaken the revision of this well-known work now appearing as the sixth edition.

The purpose and plan of the "Treatise on Pharmacy" remains the same. A chapter on Light and a chapter on Sterilization have been added; the chapters in Part II rearranged and other deletions and additions made, all with the intent to make the "Treatise on Pharmacy" better fulfill the purpose of the author.

Part I treats of General Pharmacy and the new chapters on Light and Sterilization are timely and well placed. Chapter V. Light. A discussion of light in relation to pharmacy treats of the importance of colors as a part of official descriptions, the use of colors in colorimetric determinations and the effect of light upon bacteria, organic solutions and preparations. The use of the polariscope in the determination of optical rotation and the refractometer for refractive index are described and explained. Chapter XII. Sterilization. The subject matter has been largely taken from the U. S. P. and N. F. discussions on this subject with additional matter of practical value to the pharmacist.

In Part II on Practical Pharmacy the author has prepared lists of U. S. P. and N. F. galenical and extemporaneous preparations with Latin and English titles and concise statements as to

composition, omitting the details of formula and directions for making. One of the outstanding features of this work of the greatest practical value are the special remarks following each list of the various classes of preparations, covering practical considerations and suggestions that will answer many troublesome questions concerning practical pharmacy.

Part III, Pharmaceutical Chemistry, is a pharmacist's discussion of the chemistry of inorganic and organic officinals, with easily understood rather than intricate theoretical explanations.

But few criticisms may be offered. Many errors found in the fifth revision, the result of haste, have been corrected. A few typographical errors are always found in books of this character. The student, however, might be confused by statements of solubilities at 15° C. in the discussion on saturated solutions when compared with the solubility statements of the U. S. P. IX, or by the use of the term mil with its parenthetical explanation (or Cc.).

Caspari's "Pharmacy" has long been accepted as one of the standard text and reference works on pharmacy, the author having well succeeded in making this book serve as a guide to the intelligent study of the U. S. P. and N. F. by the student and the practicing pharmacist. C. A. DUNCAN.

Introduction to General Chemistry. An exposition of the Principles of Modern Chemistry by H. Copaux, Professor of Mineral Chemistry at the School of Industrial Physics and Chemistry of the City of Paris and translated by Henry Leffmann, A.M., M.D. P. Blakiston's Son & Co., of Philadelphia, publishers. Bound in cloth, 195 pages, 30 illustrations. Price, $2.00.

The author states that it is his hope that the book "should aid students to form early in their studies correct notions of the fundamental principles of chemistry and inspire confidence in the force of chemical theories" and his work is indeed an honest attempt to succeed in this direction. In a clear and concise manner the book presents a large amount of information on the modern theoretical principles of chemistry without, however, devoting too much space to the ultra-modern and radical theories now being propounded. As the translator states, "The atom is still the unit of chemical action and the balance is still as in the laboratory of Lavoisier, the chemist's main reliance."

The book is divided into six chapters and an appendix. After an introductory chapter on The Idea of the Element, the various laws and theories are taken up in the other five. Thirty illustrations, consisting, however, mostly of graphs and curves, are provided and aid considerably in clearly presenting the material.

In addition to being a valuable text book for the student who is taking up the study of chemistry the book will make interesting reading for the practical chemist, since it is presented in readable form and requires no extended knowledge of higher mathematics for its digestion. HUGO H. SCHAEFER.

The Qualitative Analysis of Medicinal Preparations. By Henry C. Fuller. Second Edition—Rewritten, 191 pp., index inc. John Wiley & Sons, Inc., New York City. Price, $2.25.

This new edition of Fuller's work covering the qualitative examination of medicinal preparations will be welcomed by the many workers who have been using the first edition for the past eight years.

The general plan followed in the latter is retained with some elaboration tending to aid in the identification of substances removed by immiscible solvents. Procedures for the separation of alkaloids often found together in the same mixtures have been added as has been a scheme for the identification of the metals and inorganic acids. A method for the identification of volatile oils has been included in the chapter on liniments. The procedure for examining emulsions has been amplified and a section on "chewing gums" has been added.

This valuable little volume deserves a place next to its more ambitious "quantitative" cousin on the shelf of every drug analyst.

JEANNOT HOSTMANN.

NEW PUBLICATIONS.

Carbohydrates and Alcohol. Samuel Rideal. Price, 12s. 6d. net. London: Ballière Tindall & Cox.

Chemical Engineering: A Textbook of Chemical Engineering. Edward Hart. 211 pp. 200 illustrations. Price, $4.00. Easton, Pa.: Chemical Publishing Co.

Chemistry: Introduction to General Chemistry. H. Copaux. Translated by Henry Leffmann. 195 pp. 30 illustrations. Price, $2.00. Philadelphia: P. Blakiston's Son & Co.

Drugs: Analysis of Drugs and Medicines. Henry C. Fuller. 1072 pp. Illustrated. Price, $10.00, net. New York: John Wiley & Sons.

Enzymes: The Chemistry of Enzyme Actions. K. George Falk. (American Chemical Society Monographs.) 140 pp. Price, $2.50. New York: The Chemical Catalog Co., Inc.

Medicinals: The Qualitative Analysis of Medicinal Preparations. H. C. Fuller. 2d edition, rewritten. 191 pp. Price, $2.25. New York: John Wiley & Sons, Inc.

What Are Vitamines?—And Why? By Benjamin Harrow, Ph.D. New York: E. P. Dutton & Co.

PUBLICATIONS RECEIVED.

Michigan—An Important Source of Raw Vegetable Products. By Henry Kraemer. A report to the Michigan Academy of Science from College of Pharmacy, University of Michigan.

Report on Medicinal Plants. By Arno Viehoever (Bureau of Chemistry, Washington, D. C.). Reprint from *Journal of the Association of Official Agricultural Chemists*, Vol. IV, No. 1, August 1920.

The report is divided into four parts:

I. A method for the determination of volatile oil in mustard seed and substitutes.

II. Methods for the hydrolysis of linamarin and the subsequent determination of hydrocyanic acid.

III. The effect of abnormal conditions on trade in crude drugs.

IV. The value of weight of unit volumes in the analysis of crude drugs and spices.

Report of the Committee on Drug Market. Reprint from Proceedings of Pennsylvania Pharmaceutical Association, 1920 meeting; compliments Geo. E. Ewe.

METHYL ALCOHOL VERSUS "WOOD" ALCOHOL.*

The untoward consequences to human life which have followed the intake of fluids containing methyl alcohol in the last few years, and particularly since the prohibition laws went into effect, ought to leave an indelible impression of the danger of methyl alcohol to man. The more remote effects of this substance, notably the peculiar danger of ensuing blindness which differentiates methyl alcohol from the closely related ethyl alcohol or grain spirits, represent a subtle menace which is rarely suspected until the damage produced is beyond repair. The relative toxicity of the two alcohols is not adequately expressed by their immediate or acute effects; they differ in their behavior in metabolism, in the comparative readiness with which they can be disposed of in the organism, as well as in the permanent damages which they may initiate when the dosage is adequate. The comparison is not favorable to methyl alcohol. Nevertheless, in the repeated attempts made to justify the introduction of methyl alcohol for the less readily obtainable and now specifically prohibited ethyl alcohol, the dangers of the substitution are sometimes minimized by those to whom the change represents a trade advantage. It is claimed, for example, that the unfortunate properties of "wood alcohol" are attributable to "impurities" of some kind or another, and that pure or refined methyl alcohol is devoid of the larger dangers. In view of this insidious propaganda it is important to note the latest evidence which Sollmann,[1] of Western Reserve University, has contributed. He substantiates the contention that both purified methyl alcohol and "wood" alcohol are markedly more toxic than ethyl alcohol. In bringing out the deleterious effects of chronic alcoholism, Sollmann's new experiments on growing animals emphasize the greater dangers of methyl than of ethyl alcohol; but above all they demonstrate that the alleged "impurities" of ordinary wood alcohol play only a minor part in chronic intoxication. The methyl alcohol, which is the essential ingredient, is likewise the dominant toxic agent. Those who attempt surreptitiously or otherwise to foist the highly dangerous methylated spirits in any guise or under any pretext on the public can no longer hide behind the shield of the asserted "purity" of the alcohol used. We should warn the public to beware of the dangers of methyl alcohol, whether it is labeled pure or impure—or perchance whether or not it is labeled at all.

* Editorial, *Journal American Medical Association*, January 1, 1921, p. 42.

[1] Torald Sollmann, "Studies of Chronic Alcohol Intoxication on Albino Rats, II, Alcohols (Ethyl, Methyl and 'Wood') and Acetone," *J. Pharmacol. & Exper. Therap.*, 16, 291, Nov. 1920.

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